AN EPISODE APPROACH TO UTILIZATION, COSTS, AND EFFECTIVENESS IN HEALTH CARE

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Final Report

APPENDICES

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Appendix I

Derivation of Cost of Production of RVS Units by the KPMCP in 1970

A cost accountant for the Health Plan provided outpatient cost figures (Table 1) for 1970, a year chosen because it was in the middle of the 1966-1973 study period. These cost data covered outpatient services to members and to nonmembers. All costs were included: labor, supplies, interest, depreciation, maintenance, plant operations, communications, medical records, administration, and business office.

Total RVS units produced by the Health Plan in 1970 were estimated, as shown in Table 2.

For laboratory and radiology, estimation of dollar cost per RVS unit was straightforward, since outpatient costs were all that was included in the cost data for these departments. For laboratory procedures, division of the $1,016,559 costs by the 343,880 RVS units yielded a 1970 cost per RVS unit of $2.96, rounded to $3. For radiology procedures, division of the $753,030 costs by the 246,100 RVS units yielded a 1970 cost per RVS unit of $3.06, rounded to $3.

Assignment of a dollar cost per medical RVS unit was more complex.

The first issue was, how much of the emergency room and evening walk-in clinic costs should be assigned to inpatient costs, and how much to outpatient costs. Accounting office data for 1979 showed that, for 9.8 percent of the patients, hospital admission occurred within 24 hours of the emergency room contact. Setting inpatient emergency room costs by the proportion of emergency room patients who are admitted to the hospital caused the $375,949 emergency room cost to be allocated to $339,106 in outpatient care costs and $36,843 inpatient costs. Alternatively, all emergency room costs could be counted as outpatient care. Thus, depending on the assumptions chosen, outpatient emergency room costs could range from $339,106 to $375,949. Use of these estimates was based upon the assumption that patient and disease mix, and emergency room hospital admission policies, were stable from 1970 to 1979.

The second issue in calculation of the cost of a medical RVS unit was how much of the total physician cost should be allocated to inpatient, and how much to outpatient care. Several different approaches were used.

1) A 1979 survey of Health Plan physicians showed that 29.7 percent of the average physician workweek was with inpatients. This divided the $3,699,001 physician costs into an outpatient share of $2,600,398 and an inpatient share of $1,098,603.

2) Table 26, page 144 of the 1975 American Medical Association physician survey, showed that in 221 medical practices of 26 persons or more, hospital rounds and

operating room time occupied 28.8 percent of the average physician workweek.[1] This divided total Health Plan physician salary costs into $2,633,689 outpatient and $1,065,312 inpatient.

3) A methodology was devised to examine how the specialty distribution of Health Plan physicians would affect allocation of time between inpatient and outpatient care. Table 3 describes the methods and sources used:

This process involved adjusting the 1970 full-time equivalent physicians for each specialty by the appropriate share of the workweek spent on inpatient care, and then summing the results. This table indicates that 26.0 percent of KPMCP physician time was spent in inpatient care. As a result, the physician salary costs were allocated between $2,737,261 outpatient costs, and $961,740 inpatient costs.

If emergency care physicians were assumed to spend 9.8 percent of their time treating patients destined for hospital admission (as suggested by the 1979 accounting office allocation of 9.8 percent of emergency room costs to inpatient care), then the inpatient share of overall physician costs was 23.5 percent. Designation of all emergency care physician costs as outpatient meant that the inpatient share of physician costs was 21.9 percent, and outpatient costs were $2,888,920.

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[1] Figures from Table 26, p. 144 of the 1975 American Medical Association physician survey.

Thus, depending on the assumptions chosen, outpatient physician costs for 1970 ranged from $2,600,398 to $2,888,920. Therefore, total outpatient costs for producing adult medical, pediatric, and surgical CRVS units were:

Physical Therapy	$ 75,798
Optometrists	188,365
Mental Health	168,554
Nursing	2,108,900
Home Health Care	229,615
Emergency Room	339,106 - $ 375,949
Physicians	2,600,398 - 2,888,920
Total	$5,710,736 - $6,036,101

Dividing the high estimate and the low estimate by the estimated 1,199,346 medical RVS units produced by the Health Plan in 1970 yielded a range of $4.76 - $5.03 per medical RVS unit. A rounded estimate, $5 per medical RVS unit, was accepted as the dollar conversion factor for the episode report.

It is important to note that the estimate of $3 1970 cost per laboratory and radiology RVS unit, and $5 cost per medical RVS unit, is based on KPMCP costs of outpatient operation. This dollar valuation of RVS units is different from the more common practice of basing RVS unit dollar values on market-based fees for service.

Table 1

1970 COST DATA FOR THE HEALTH PLAN, PORTLAND, OREGON

Outpatient radiology	$ 753,030
Outpatient laboratory	1,016,559
Outpatient physical therapy	75,798
Optometrist salaries	188,365
Emergency room and evening clinic - total costs	375,949
Mental health	168,554
Outpatient nursing	2,108,900
Physician salaries - include all, inpatient or outpatient	3,699,001
Home health services	229,615
	$8,615,771

Table 2

RVS UNIT PRODUCTION BY THE HEALTH PLAN IN 1970

	Total RVS Production, All of 5% Random Sample	Adjustment, 5% to 100% Sample	Estimated Total RVS unit Production, Entire Outpatient Health Plan
Laboratory	17,194.0	X 20 =	343,880
Radiology	12,305.0	X 20 =	246,100
Medical (Adult medical + surgical + pediatric)	59,967.3	X 20 =	1,199,346

Table 3

INPATIENT SHARE OF WORKWEEK FOR HEALTH PLAN PHYSICIANS IN 1970

Specialty	Percent of Workweek Inpatient Care	X	Health Plan Physician Full-Time*** Equivalents, 1970	=	Inpatient Health Plan Full-Time Equivalents, 1970
Internists	23.1*+		29.2		6.74
Pediatricians	14.1*		15.9		2.24
Allergists	5.3*		1.0		0.05
Otolaryngologists	27.3*		3.3		0.90
Ophthalmologists	12.3*		2.8		0.34
Obstetrics/ Gynecology	32.7*		10.0		3.27
Dermatology	3.9*		1.4		0.05
Surgery	43.9†		12.2		5.35
Radiology	6.7†		3.9		0.25
Psychiatry	14.1†		1.0		0.14
Anesthesiology	86.0†		4.0		3.44
Emergency Care	23.1**		20.4		4.71
Other Physicians	23.1**		7.7		1.78
ALL FTEs			112.8		29.26

29.26/112.8 = 26.0%, inpatient share of Health Plan physician time

* Data from Robert C. Mendenhall, Practice Study Reports for physicians of various specialties, at the University of Southern California School of Medicine in Los Angeles; sponsored by the Bureau of Health Manpower, Hyattsville, MD. Data based on survey of physicians in each specialty in group practice, who log activities for three consecutive workdays. This was the preferred data source, due to large sample size and valid information gathering.

** For these categories, it was assumed that the proportion of inpatient time is equivalent to that for internists. As explained in the text, changing this assumption raised the share of time that Health Plan physicians are assumed to spend in outpatient care.

***Based on HSRC calculations from 1970 payroll data.

† Data from American Medical Association Physician Survey, 1975, Table 25, page 143. Data based on survey of physicians by specialty; proportions were self-reported estimates of the share of total workweek spent in the operating or delivery room, or on hospital rounds.

+ The inpatient share of internist time was confirmed by a survey of primary care Health Plan internists, who indicated that 23.3% of their workweek was hospital rounds and hospital calls. Source: Table 3, p. 110 of Cost-Effectiveness of Physician Assistants in a Maximum-Substitution Model, Phase Two, by Jane Cassels Record, et al.

APPENDIX II

EPISODE DEFINITIONS IN DATA SYSTEMS
AND
EPISODE ANALYSIS METHODOLOGY MEMORANDA

EPISODE

ACUTE

Acute begins at the time of the contact (direct or indirect) where specific morbidity diagnosis is made or updated by subsequent information. Acute conditions are usually considered a new episode when recurrence of condition occurs after 90 days from first service and there is no indication or connotation of continuity. Upper Respiratory Infections are considered new episodes if clearly recurring after 30 days.

Acute conditions are considered recurrent and recorded as initial episodes related by service morbidity number when characterized by physician or patient in terms of continuity (eg. recurrent, persistent) or if clearly related to a previous visit for a condition.

Acute conditions are considered new episodes when there is no indication or mention of continuity and given the clinical nature of the disease, sufficient time has elapsed since the last contact. The timing of the clinical course of the disease requires medical evaluation and should be verified by the medical staff.

CHRONIC

Once experience, all subsequent contacts for the specific condition or complications arising from the condition are related by service morbidity number. If completely corrected by surgery and subsequently recurs, a chronic condition is treated as an initial contact and related by service morbidity number to the original episode number.

New members enrolled in the study with previously established chronic conditions diagnosed outside Kaiser are recorded initial episode for first contact to Kaiser. New members enrolled in the study with conditions documented in the Kaiser medical record before the patient was included on the study will have a continuing episode number to the day before the start of their inclusion on the study. With the terminal digits 01 for the first such disease, 02 for the second such, etc. Thus, for a patient added to the study on 2-1-68 and having a continuing morbidity (from data documented in the Kaiser medical record) would be recorded under episode as 1-30-68 01, or 1-30-68 02, etc.

Episode (col. 46)

Episode pertains to initial visit or continuing visit for a morbidity or condition. Initial visit may be related to a service morbidity number which is defined:

> The episode service morbidity number is the date for the first time a morbidity or condition is diagnosed. Several morbidities, conditions, and complications from a previous coded morbidity are related by the Episode Service Morbidity number being the same.
>
> A continuing Episode will always have a service morbidity number recorded.

Not all diseases and conditions are considered Episodic in this study.

Episode - Predating

All conditions diagnosed in the medical record before the patient became effective on the study will be pre-dated to the day before the service effective date.

A patient became effective 02-68 and has (3) two continuing morbidities.

	Predate	DSN		MN
First Predated Morbidity	01-31-68	0	-	1
Second Predated Morbidity	01-31-68	0	-	2
Third Predated Morbidity	01-31-68	0	-	3

If the Service is related to a morbidity that originated in the hospital, the Episode service morbidity number refers to the hospital admission date (DSN will always be 0).

Code Number	Episode	Definition
1	Initial Visit	Code Initial visit for the first occurrence of a new condition or the first appearance of a complication. Recurrence of an acute condition after 3 months will be considered a New Episode (initial visit). Upper Respiratory Infections (URI). will be considered a new episode (initial visit) if clearly recurring after one month. ? A chronic Disease corrected by Surgery and reoccurs after patient was observed for this condition becomes a new initial episode. but the Serv. morb. No. of the previous occurrance is recorded. Obesity and Pregnancy will not be considered as having the same episode morbidity number, but as having two distinct medical conditions, unless it is clearly obesity of Pregnancy which will be related by the same episode no. Do not relate Eye Diseases (381-389) to Refractive Error (380).
1	Initial Visit and related to a previous episode	Code for a new occurrence of a previous coded morbidity and record the date, DSN(Day Service No.), and MN (Morbidity Number) for that previous coded morbidity. The episode number for complications of a previous coded morbidity will be coded the same for all subsequent services for this complications.

Initial Visit and Related to a previous Episode

Relate the following conditions when they occur together:

- Coryza
- Rhinitis
- Sinusites
- Otitis Media
- Pneumonia

Adverse Effect of a drug is related to the morbidity for which the medication was originally Rx.

A distinct disease such as gout may be produced as an adverse effect of a drug.

Presenting Morbidity	Associated Morbidity
Adverse effect of Drug	Gout

The presence of the same episode number will show the connection between the two morbidities.

All Services ordered from a previous visit will be related in episode.

Immunizations ordered at the time of a Physical Examination will be coded initial visit and related to the episode number of the P.E.

When an immunization is given yearly after the initial series code intial visit and relate to the previous morbidity number for the immunization.

If the ICDA code changes from an initial or continuing episode for a Eye Refraction then code initial visit and relate to the previous refractive episode (prior to 10-09-68 eye refractions were coded continuing from the initial episode).

Pregnancy at Term should be coded initial visit and related to Prenatal Care Episode Number.

Infected Skin Lesions are coded by listing the primary Skin disease as one morbidity and pyoderma as a second morbidity. These two conditions are related by having the same episode service morbidity number.

Dx Infected Sebaceous Cyst

Presenting Morbidity:		Associated Morbidity:	
Morbidity Name	Sebaceous Cyst	Morbidity Name	Pyoderma
ICDA No.	714.2	ICDA N.	698.0
Episode	Initial Visit	Episode	Initial Vi & related Sebaceous Cyst

Continuing Episode

If patient is returning for Secondary Infection (Pyoderma) then code:

Presenting Morbidity		Associated Morbidity
Pyoderma		Skin Disease
698.0		714.2
Cont. Episode	same	Cont. Episode

Code Number	Episode	Definition
2	Continuing	Once the patient has experienced a disease then all subsequent services for that illness or condition and all complications arising out of that illness or condition (after the initial visit) are to be recorded as continuing episode. Code continuing episode when the condition has been diagnosed from a previous service recorded in the medical record. Code continuing if the condition is updated from a previous service. Code continuing if the Physician characterizes the condition in terms connoting continuity such as "recurrent" or "persistent".

Coninuing Episode

If the first service for a morbidity is by phone, then the first physician visit is to be recorded as continuing with the same service morbidity number as for the initial phone call (Item F - code #9001 primary procedure number for the initial office visit).

Some I.C.D.A. Diagnosis will change because of a change in the clinical status of the patient rather than in a basic change in the Physician's perception of the illness.

Example:

Congestive Heart Failure is a state of actual congestive failure at the time the patient was seen. On subsequent visits it may be that the C.H.F. is no longer present although the patient requires continuation of the medication previously Rx. The I.C.D.A. will change from 434.1 (CHF) to 434.8 (Compensated CHF).

The episode will be continuing from the same service morbidity number as coded for C.H.F..

Myocardial Infarction is ICDA coded 420.1. At some point after convalescence the ICDA code changes to 420.2 (healed Myocardial Infarction). This will occur when the physician instructs the patient to return for his next visit in more than a one month period.

A series of immunizations stemming from a single visit will have a continuing episode with the same service morbidity number.

Code Number	Episode	Definition
9	Inapplicable	

MORBIDITY AND ICDA CODE

A Morbidity of Pelvic Inflammatory Disease (P.I.D.) treated with 4.8 million units of a penicillin and also a Rx of Benemid should be coded Gonococcal infection 030.0 with a TENTATIVE Status of Diagnosis. Update morbidity on basis of lab report. /12-18-74

Ocular Hypertension 387.4

Ocular Hypertension should be coded Glaucoma if treated.

A morbidity of Suspect Glaucoma should be coded Ocular Hypertension NOT GLAUCOMA. 12-18-74

INTER-OFFICE MEMORANDUM

TO Dr. Hurtado MD
AT Sunnyside Medical Center

COPIES TO
File

DATE 12-14-76

FROM Mary Ellen

AT Regional Facil

SUBJECT

DOCUMENTATION - OUTPATIENT STUDY

Patient is on diuretic for Hypertension. Hypokalemia shows up on lab report. Physician calls patient as a result of lab result and gives Rx.

Code Associated Morbidity.....Hypokalemia (Tentative)

Procedure.....................1111 (Dx. made from lab result)

Symptoms......................A960 (Non-Allergic Adverse Effec
A960 Service Effective 01-74

NOTE:
Prior to 01-74 we coded E904 for Non-allergic A.E. of drug for Hypokalemia.

A patient is seen for a cut wrist as a result of Suicide Attempt.

Presenting Morbidity..........Cut Wrist
Associated Morbidity..........Suicide Attempt (324.9)

INTER-OFFICE MEMORANDUM

TO Research Employees
AT Regional Facility

COPIES TO

DATE 5/8/78

FROM Dianne

AT

Effective May 4, 1978

SUBJECT

Process of OM - If you have a Dx of Om (391.9 or 391.3) and it becomes a Serous then continue 391.9 or 391.3. Do not code Serous (391.0) initial relate.

Recurrent - within 2 year period - relate back to the date the Dx. was first acute. All of those inbetween will be initial related. If recurrent and you have an acute initial relate to the recurrent forever unless there isn't one for 2 years.

to 5
correct 9.1 (acute OM) by initial + relate

Chr. OM - If a patient is being carried for Chr. OM and the chronic clears no longer carry Chr. If the Chronic is carried and no clearing inbetween continue the chronic. (Codau If a Chronic is being carried and there is an acute OM initial relate to the chr.

EXAMPLE: If a patient comes in with LOM and is told to return for a followup and upon the followup the patient now has ROM, drop the LOm and carry the ROM initial.

Relate colds to the Chronic and Acute OM's.

If Som become Purulent then initial relate.

on an

INTER-OFFICE MEMORANDUM

TO Senior investigators, research assistants, data processing, etc.

Research Center

COPIES TO

DATE 30 July 1974

FROM Debbie

AT

SUBJECT Study 1: Episodes and How to Deal with Them--A Guide to the Perplexed

Don has asked me to send this around to all of you who will be including episodic considerations in present and future studies. It is a basic explanation of how and why episodes are coded, and how to interpret them, written by Mitch and Jay Glasser. There will be a prize for the first person who can follow Example 3 through to the bitter end.

Mary Ellen - Please read & keep in your files

Example 3 is wrong in several ways and they used the 8th edition ICDA codes for Example 3 in error

all the col. nos. mentioned in here refer to a special analysis tape (#2956)

Check Procedures Related to Specific Users

One general problem alluded to earlier concerns the data recorded on the master tapes at Portland and the variables abstracted from them for specific research purposes. For instance, a situation arose on one tape request when the restriction of a full year's membership in the Plan was applied. The file that was provided excluded, by definition, all Plan member newborns for that period. Such an occurrance well illustrates both the need for checking procedures, and the importance of a data request procedure. Errors are inevitable, but rather embarrassing; an efficient data request procedure should minimize them. It is in this sense that "reliability" was expanded to consider the entire data system process.

In summary, we have found the data to be of good quality in terms of the final data set received. However, the usual problems with large data files and a complex system are encountered. The system, therefore, cannot be appropriately evaluated without keeping both of these dimensions in mind. It is extremely important to produce written documents and examples of the use of the system because of the perishable nature of each individual's memory. A cumulative record and documentation of specific aspects of the system will result in an overall improvement in the general retrieval qualities of the entire system.

An Introductory Guide to Understanding the Way and Individual's Utilization Pattern is Linked Across Records in the Kaiser Data Files

The Kaiser data system has been structured to provide information to facilitate research on a diverse set of utilization questions. Studies on the etiology of a particular disease syndrome in time, cross sectional studies on utilization in defined subgroups, and an individual's total utilization patterns are examples of these differing perspectives. Each requires data of a particular nature. The data system exists solely to support these and other studies and the files are so structured. The data system is complex. The rationale helps to put the system into perspective. This exposition is designed to illustrate the structure and its relation to the tracking of an individual's utilization experience through this record system.

A method of such linkage is provided for in the Kaiser files, but the ability to trace a patient's records, disease by disease over time, is crucially dependent on a thorough understanding of these elements of coded data:

1) Date of Service (D.S.
2) Day's Service Number (D.S.#)
3) Morbidity Number (M.#)
4) Presenting or Associated Morbidity (P. or A.M.)
5) Updated Presenting or Associated Morbidity (U.P.orA.M.)
6) Episode (E.)
7) Service Morbidity Number (S.M.#)

The Date of Service is in YYMMDD format, and specifies the date the services noted on a particular record were rendered. In this context a "service" could be anything from a letter, phone call, a change in medication, to an actual surgical procedure.

The Day's Service Number is a single-digit number with these meanings:

1-5	identifies the ordinal number of the service rendered to the patient on that day.
6	physician has cancelled appointment.
7	patient failed to keep scheduled appointment.
8	patient has cancelled appointment.
0	when Form A (primary outpatient source document) is used for inpatient admission to Bess Kaiser Hospital or E.C.F.

A Presenting Morbidity is that which brought the patient into the contact with the system, and is entirely dependent on the patient's perception of his own health status. It is not connected, then, to any ordering of "seriousness" of illness, and in retrospect can be quite trivial. An Associated Morbidity is any other condition treated during the same visit. The recognition and order of treatment of Associated Morbidities is therefore dependent on the physician's perception of and regard for such conditions.

The Morbidity Number records those data and the codes are:

1	Presenting morbidity
2	First associated morbidity

3 Second associated morbidity

.

.

.

9 Eighth associated morbidity

0 Did not keep appointment

The Presenting or Associated Morbidity names via the International Classification of Diseases, Adapted or the Kaiser Project Symptom Codes, the specific morbidity being itemized in a particular record. If the Morbidity Number is "1", then the Presenting Morbidity is the one being documented; if the Morbidity Number is "2", then the First Associated Morbidity is being documented, and so on.

The Updated Presenting or Associated Morbidity follows the same scheme as the Presenting or Associated Morbidity, but records a change in the original diagnosis. It represents an update in the judgment of a medical condition, usually to a more refined or precise statement of the problem based on tests, further examination, or subsequent medical evaluation. It is important to note here that no matter how many updates occur, neither the original denotation of the condition, nor the chain of reevaluation is ever lost from a patient's records.

The Episode code is a single-digit number with these possibilities:

1 Initial visit

2 Continuing

3 Inapplicable

and refers only to the morbidity being documented in that record.

A recurrance of an acute condition will be coded "1" if, given the nature of the condition, sufficient time has elapsed between the anticedent and present visit. In general, recurrence of an acute condition after 3 months will be considered a new episode. URI's, however, will be considered a new episode if clearly recurring after 1 month.

For the several diseases defined as chronic by the Kaiser (Portland) standards, once a patient has experienced any of those diseases all subsequent visits for that condition are recorded as "2". If a chronic disease is completely corrected by surgery and recurrs, that recurrence constitutes an initial episode ("1"), but the Service Morbidity Number of the previous occurrance is recorded.

The Service Morbidity Number is an intricate construct that is the prime key to tracing patients' records over time. It is a combination of the Date of Service of the initial visit for the morbidity being documented in a record, the Day's Service Number of the initial visit for that morbidity, and the Morbidity Number of the initial visit for that morbidity. The Service Morbidity Number is eight digits long in this format:

DIGIT	CONTENT
1-6	MMDDYY, Date of Service of initial visit for a morbidity.
7	Day's Service Number of initial visit for that morbidity.
8	Morbidity Number of initial visit for that morbidity.

Not coded that way in the current [illegible] 2256 tape

When the KHSRC first began to construct these records, the Service Morbidity Number for the initial visit for a new morbidity was coded 99999999. As of October 1968, however, the S.M.# began to be coded as the Date of Service, Day's Service Number and Morbidity Number for the initial visit of that new morbidity. In other words, the initial D.S.N. now records the same information found earlier in the same record.

Thus, all of records of a patient's service for a particular morbidity are linked to the initial service for that morbidity, and can be followed over time using primarily the Episode Number, Updated Morbidity Code, and Service Morbidity Number.

The seven elements appear in the Outpatient Records in the same order as they are listed above, in the indicated columns lengthwise across the page:

ELEMENT	COLUMNS	
Date of Service	29	34
Day's Service Number	35	
Morbidity Number	36	
Presenting or Associated Morbidity	46	50
Updated Presenting or Associated Morbidity	52	56
Episode	57	
Service Morbidity Number	58	65

A schematic of them would look like this:

D.S. D.S.# M.# P. or A.M. U.P. or A.M. S.M.#

Please remember that each record begins with a Data Set number and an HPID number, and can fill up with numbers two full lines of standard computer print-out paper. We are going to examine the relationships of only the seven variables herein under discussion.

Example 1

For openers, the representation of the record for the initial visit for measles (85.0) on July 12, 1968 would look like this:

(D.S.)	(D.S.#)	(M.#)	(P. or A.M.)	(U.P. or A.M.)	(E.)	(S.M.#)
680712	1	1	0850	0850	1	07126811

Note, please, that the formats of the D.S. and date section of the S.M.# are different.

If the patient returned a week later and was treated only for the same case of measles, the numbers would be:

680719	1	1	0850	0850	2	07126811

Notice that the Episode code now indicates a continuing episode, and that the S.M.# refers back to the initial visit for this morbidity.

If the patient returns three days later because of non-specific tonsillitis (430.0) and then was examined for his measles, the records would read:

680722	1	1	4730	4730	1	07226811
680722	1	2	0850	0850	2	07126811

The D.S.# would be "1" on both records because each record would document only the first service performed for each morbidity. Second, third, etc. services would be likewise documented. The measles E. is again "2", indicating a continuing episode for that condition.

Example 2

A patient arrives on August 7, 1970 to be treated for a stroke of unknown origin (335.1); his record is:

700807	1	1	3351	3351	1	08077011

After some tests later that day, it is determined that the stroke was caused by an hemorrhage (331.0). The patient's record is then changed to:

700807	1	1	3351	3310	1	08077011

A week later the patient returns for treatment, and the record reads:

770714	1	1	3310	3310	2	08077011

The U.P.M. of the previous visit has become the P.M. for this visit; the S.M.#, however, refers us back to the original visit for this ailment.

At a visit two weeks later and after still further tests, the diagnosis is again updated, this time to stroke caused by embolus (332.0). The record for this visit reads:

770828	1	1	3310	3320	2	08077011

and his past records are updated to reflect the new diagnosis. All of the patient's records for this condition now look like this:

700807	1	1	3351	3320	1	08077011
700814	1	1	3310	3320	2	08077011
700828	1	1	3320	3320	2	08077011

Example 3

Multiple services for multiple conditions generate somewhat more complicated records. Consider a patient with the following established conditions:

Condition	ICDA	S.M.#
Pulmonary Tuberculosis active, minimal	011.0	09146911
Chirrosis of the Liver, alcoholic	517.0	09146912

In other words, on September 14, 1969 the patient was first treated for those conditions, tuberculosis being the Presenting Morbidity and chirrosis the First Associated Morbidity. On December 6, 1969 he came in to be treated for a sore, inflamed, abscessed toe, diagnosed as cellulitis (681), and was also examined for his existing condition; the records read:

691206	1	1	6810	6810 infection	1	12066911
691206	1	2	0110	0110 TB	2	09146911
691206	1	3	5710	5710	2	09146912

1

During the examination for chirrosis a condition of chronic appendicitis (542) is discovered, generating this record:

```
691206   1   4   5420   5420   1   12066914
```

Surgery for the appendicitis is performed:

C

```
691206   2   4   5420   5420   2   12066914
```

Later, chemotherapy for the tuberculosis necessitates a trip to the injection clinic:

9'

```
691206   2   2   0110   0110   2   09146911
```

and therapy is prescribed for the chirrosis:

```
691206   2   3   5710   5710   2   09146912
```

The results of the examination of the celluitis are returned, and two discoveries are made. Firstly, the condition is present in less acute form over most of the patient's lower extremities, and secondly, that the cellulitis is directly related to impared liver function caused by the chirrosis. The Updated Presenting Morbidity then becomes 682.9, and the Service Morbidity Number is changed on all appropriate records to relate the cellulitis to the chirrosis. The abscess is drained, and this last record now reads:

```
691206   2   1   6810   6829   2   09146912
```

All of the patient's records for that day read:

9

```
691206   1   1   6810   6829   1   09146912
691206   1   2   0110   0110   2   09146911
691206   1   3   5710   5710   2   09146912
691206   1   4   5420   5420   1   12066914
691206   2   1   6810   6829   2   09146912
691206   2   2   0110   0110   2   09146911
691206   2   3   5710   5710   2   09146912
691206   2   4   5420   5420   2   12066914
```

Thusly, one can study the histories of patient conditions or the courses of physicians' perception or treatments over time. Liberties have, of course, been taken with the time frames and the medical realities of these events, but only for the sake of the examples. Same-day multiple services for multiple conditions are complicated and intricate, but their analysis is illuminating pursuit and well within the structural limits of the Kaiser Data Files.

Item B

Status of Diagnosis (col.41)

Status of Diagnosis pertains to the Morbidity Name recorded in Item A for each Morbidity recorded.

Code No.	Status of Phy.	Definition
1	Unknown	Code unknown if a symptom (T code) is recorded in Item A. Code the symptom (T code) in item A if two or more diagnosis are ruled out(R/O). Unknown Diagnosis (ICDA No. 795.9). No Disease Present (000.0).
2	Tentative	Code tentative if the Physician notes the following terms before or after the diagnosis: Suspected Possible R/O Rule-Out ? All new diagnosis made by telephone or letter will be coded tentative. Functional Diagnosis except non-organic will be coded tentative. A new Morbidity found from Lab or X-ray tests will be coded tentative.
3	Established	Established is coded if the Physician treats, orders Rx, or refers patient (consultant) for a morbidity. Code established for the following morbidities: Newborn Pregnancy Delivered Postpartum Exam. Social Problems Rx for Beestings Y02.1
4	Inapplicable	Inapplicable is coded when the ICDA number coded in Item A indicates that no morbidity is

4	Inapplicable	present which includes the following: Pelvic Exams Well Child Care (WCC) Eye Refractions & Eye exams Service for Oral Contraceptives Immunizations Notations without a Morbidity Phone Call without a Morbidity Letter without a Morbidity Unknown Morbidity (000.1)

CHRONIC CONDITIONS

The following conditions are considered Chronic:

- Chronic cystitis
- Depression
- Neoplasms (Malignant, Benign, & unspecified)
- Obesity
- Diabetes
- Hypertension, Essential
- Migraine headache

TO:Episode people

From:Lee

Re: Revised analysis protocol, based on ep. meeting discussion

6/19/80

Memo I

OBJECTIVES OF PHASE I REPORT

1. Define the condition which you are analyzing, and explain how you use the concept of "episode of care".
2. Describe the population being analyzed. (Age, sex, comorbidities, etc.)
3. Describe how patient-related, system-related, and physician-related variables influence total resource use in diagnosis and/or treatment of your condition.(Resource use refers to summary measures of utilization: total RVS and the subclasses of RVS, total no. of contacts, no. of clinic contacts.)
   This analysis should include:
   --Bivariate analysis, examining resource use as a function of each separate patient/system/physician variable. Aims: description of patterns of resource use, isolation of key variables for further analysis, and clarification of how to proceed in multivariate analysis.Use BREAKDOWN, CROSSTABS, PEARSON CORREL.
   --Multivariate analysis Patient/system/MD variables should be independent variables, with total resource use measures as the dependent variables in AID runs.
4. Using AID, identify bundles of care for your condition. (Bundles of care refers to the mix of procedures -- lab tests, x-rays, drug orders of a given type, hospitalizations, office procedures, office visits-- used to manage a given episode. These should be the procedures which were counted separately as procedures of interest on your episode file.)
5. Using AID, John's log-linear multiple classification program (hereafter referred to as LLMCP), and frequencies or breakdowns, describe how patient, system, and MD characteristics influence the likelihood of receiving a given bundle of care. Bundles of care may refer to diagnosis and/or treatment.
6. With the help of a memo to come from Jane and me later this summer, value alternative bundles of care in dollar price of the bundle on the market, and in dollar cost to the system of producing the bundle, as well as in RVS units.
7. Decide whether you recommend your condition for Phase II analysis; a final decision will be made by the team once all disease reports are done.

8. Outcome, quality of care, input substitution within and between bundles will be discussed in a general essay, not handled in disease-by-disease reports.

Cover letter/summary of memo 2

SUBJECT : SUMMARY OF INSTRUCTIONS ON HOW TO HANDLE YOUR PRINTOUT

Follow these steps:

I--Upon receiving the episode printout, examine it for errors, discrepancies, and missing information.

II--Decide which measures of resource use are appropriate for analysis of your condition.

1. Will you examine the behavior of a subclass of RVS, such as lab RVS, or will you examine only total RVS?
2. Will you examine the behavior of total clinic contacts, or other counts of the number of contacts (SCVAR1-7,37), in addition to examining RVS measures?
3. Will you use rates of resource use or total resource use as a dependent variable?
4. Within the episode, do you wish to examine an initial workup period in addition to examining the entire episode?
5. Do you need the calendar file?
6. Do you need to distinguish between new and continuing episodes?

III-Do bivariate analysis of the data, with resource use measure(s) taken as the dependent variable(s), and with each patient/system/physician variable taken separately as an independent variable. Use BREAKDOWN, FREQUENCIES, CROSSTABS, AND PEARSON CORR as needed.

IV--Do multivariate analysis of the data. Use AID to examine how patient/system/physician variables interact to influence total resource use. Use AID, with resource use as a dependent variable, and with utilization measures as an independent variable, to define bundles of care. Use John Mullooly's log-linear multiple classification analysis to determine how patient/system/physician characteristics influence the probability of a patient getting a given bundle of care.

V--Seek other data which may be needed to describe the population and the episodes you are studying, and to meet the objectives of the Phase I report.

Memo 3 is a classification of which variables fall into which classes: patient characteristics, system characteristics, physician characteristics, and measures of resource utilization. It is a follow-up on team suggestions that we develop a common nomenclature for variables.

INTER-OFFICE MEMORANDUM

To

At

Copies to

Date

From

At

MEMO 2, P. 1

Subject : THE GORY DETAILS--HOW TO HANDLE YOUR PRINTOUT

I--UPON RECEIVING THE EPISODE PRINTOUT, EXAMINE IT FOR ERRORS, DISCREPANCIES, AND MISSING INFORMATION.
Look for these possible problems:
-Subtotals of RVS do not add up to total RVS .
-Subtotals of specific types of contacts do not add up to total contacts--if you specified such variables.
-Duration of episode, or mean number of comorbidities per contact in the episode, or other computed variables yield outlandish results, or results totally unexpected from inspection of the contact file.
-Error or confusion in labeling variables.
-Failure to create variables which you specified in your data request.
DO be sure to check the program at the front of your printout, to be sure that computed varaibles were created that have the meaning which you intended when you requested them.
Clear communication with Marilyn on what you want when asking for extra episode level variables, or when making an analysis request, will save you both much delay and toil.

II-DECIDE WHICH MEASURES OF RESOURCE USE ARE APPROPRIATE FOR ANALYSIS OF YOUR CONDITION.

1. Will you examine the behavior of a sub-class of RVS, such as lab RVS or office procedure RVS, or will you examine only total RVS?

   Examination of the share oftotal RVS which is accounted for by the subclasses of RVS, variables PCTLETT-PCTXRAY, will show which RVS classes contribute most to total RVS. This, with knowledge of medical decisions to be made in managing your condition, should help you decide whether to examine only total RVS as a measure of resource use, or to also examine lab, xray,etc. RVS subclasses.

2. Will you examine the behavior of total clinic contacts, or other counts of the number of contacts(SCVAR1-7,37) , as a dependent variable?

   If a disease has many co-morbidities,the chances increase that services performed at that contact will have their RVS units coded to another condition. This may skew total RVS as a measure of resources used in managing your condition. If so, it is useful to examine SCVAR2, total clinic contacts, as a measure of total resource use to check and supplement SMVAR49,total RVS.Ask whether these two summary measures act similarly under the influence of age/sex/morbidity group/ other patient/MD/system variables of interest.

3. Will you use rates of resource use or total resource use as a dependent variable?

   If your disease is chronic, with episode lengths ranging from one contact to

INTER-OFFICE MEMORANDUM

To
At
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MEMO 2, P2

Subject

seven years,use rates of resource use per unit of time in the episode as your dependent variable. The characteristics of your disease dictate whether you examine RVS per week, month, 6 months, or per year;examine the DURATION variable in your file. An acute condition, for which all episodes are brief and of standard length, may be analyzed using either total RVS, etc., per episode, or by examining total RVS per week of the diease episode.

4. Within the episode, do you wish to examine an initial workup period as well as the entire episode?

Your disease may be one in which the first contact, or first week, or first month, or first year will call forth a different bundle of care and/or a different level of total resource use than the episode as a whole. If you have medical reason to think that this is the case, you should ask that measures of total resource use and/or measures of the bundle of care given be counted separately for the critical period as well as for the entire episode.

5. Do you need the calendar file? Applies only to chronic conditions.

[illegible]

Calendar file information has been obtained for obesity, depression, and hypertension. Investigators should consider whether this is necessary for other chronic diseases in Phase I.Calendar file information has two purposes:
1. Adjustment of rates of resource use per episode year, so that this rate is calculated only for months during the episode for which the patient is eligible for Health Plan coverage.
2. Determination of the gap between the final episode contact and the end of patient eligibility for coverage (if this occurred on or before 12/73), and determination of the gap between the last contact and the end of the end of the study period.

6. DO you need to distinguish bwtween new and continuing episodes?

Is there medical reason to think that a patient who appears at Kaiser with your disease as a pre-existing condition will get a different bundle of care or a different level of RVS use than somebody else with the same disease who has that illness diagnosed for the first time within the system? If so, you may want to get a list of cases from Marilyn, which will specify each case as new or continuing. You could then check this list against the morbidity record printout, to determine whether or not the computer was right in labeling a given episode as new or as continuing.(When I did this check for hypertension, I found numerous episodes in which the classification needed to be changed.)

MEMO 2, P.3

III. DO A BIVARIATE ANALYSIS OF THE DATA, WITH THE CRITICAL RESOURCE USE MEASURE(S) AS THE DEPENDENT VARIABLE(S), AND WITH EACH PATIENT/SYSTEM/MD VARIABLE TAKEN SEPARATELY AS AN INDEPENDENT VARIABLE.

Do bivariate analysis of resource use. This is an initial fishing expedition, so examine either total RVS or rates of total RVS. If you have identified one or two other critical resource use measures, use them too at this stage as dependent variables.

Below is a list of episode-level varaibles which can be used as independent variables; choose those which are appropriate for your disease and population. Each subclass of your independent variables should have a population of at least 25 .

For each dependent variable that you choose, ask for a BREAKDOWN run of that variable as a function of these patient/provider/system variables:

---Agegroup at index contact.

Suppose you have 3 age groups: 18-34, 35-49, and 50+. With BREAKDOWN, you will get the mean resource use for people in each age group, and a standard deviation, and the number of people in each age group. Use of the standard deviation, or the calculation of the standard error of the mean for each age group, will enable you to tell whether, taken alone, the age groups you chose are predictive of resource use.

POINTER: You may be undecided whether to use a 3, 4, or N-class age group. If you do a BREAKDOWN on the two or three age groupings that you have in mind, you will be able to tell whether the two or three ways of grouping by age tell the same story in resource use patterns.If a 3-class age grouping and a 4,5,or 10-class age grouping reveal similar patterns of resource use with age, use the age grouping with the smallest number of subclasses for the remainder of your analysis.Likewise, if you initially created only 1 agegroup varaible, with three classes, and this BREAKDOWN reveals that two adjacent classes have similar resource use, and one is significantly higher than the other two, then create a new agegroup variable with only 2 classes. One class would be a combination of the two similar age classes in your first agegroup variable, and the other would be the standout age class. The rationale is that the analysis becomes more tedious and cumbersome with each extra cell you create.Creating unneeded cells will add markedly to your workload in preparing the report.Use this BREAKDOWN step as, among other things, a way to cut the number of cells in key variables.

----Co-morbidity group.

Be sure to create morbidity groups that are mutually exclusive and which ,taken together, include all the episodes in the population you wish to analyze.Create as few morbidity groups as is reasonable for your set of episodes. Again, the aim is to cut the number of cells you must analyze.

---Sex, if relevant to your population/disease.

---PCTPRES, the % of contacts in your episode in which your dieease is the presenting morbidity for the contact. This is a continuous varaible which should have its values grouped into classes to be used with BREAKDOWN. This same advice holds for other continuous varaibles, including others such as PCTLETT-PCTXRAY.

---Presence or absence of symptoms of interest, if you created such a variable

---Presence or absence of adverse drug reaction in the episode, if you created such a variable.

---New versus continuing episodes

---Either MNCOMORB , the mean number of comorbidities per contact, (if your disease is chronic) or U50, no. of comorbidities in the index contact, if your episode is acute.

---Year of index xontact

---Episode duration, expressed in appropriate time units and divided into subclasses.

---MD specialty at index contact, if your disease is acute

---MD number at index contact.

Under certain conditions, this can be used as a way to measure interphysician variation in resource use. Marilyn can flag episodes in which the doctor at the index contact is the only provider that the patient saw throughout the entire episode. For these single-doctor episodes, a frequencies run of variable U16 will show how many times each provider handled episodes of your condition. You can then choose the specific doctors of a given specialty who saw over 20 (and preferably over 50) cases of your condition, and do a BREAKDOWN run, using those doctor numbers as an independent variable. The ETA-squared statistic will show the proportion of the total variation in resource use for those episodes that is statistically explained by the individual doctor.

---MD status at index contact

---Specialty over the episode.(derive from SCVR19-SCVAR31)
You may find, that in SCVAR19-31, most MD contacts for your disease are with internists, and that 20% of contacts over the whole episode are with other specialties. You may wish to ask whether the mean total RVS use for patients with disease X is different for those who saw only internists in their episode than it is for those whose episodes included at least one visit to an MD of another specialty.

---MD status over the episode (derive from SCVAR 32-34)
Here, you may wish to ask whether mean RVS use is significantly different for those whose episodes included a visit to a consultant than for those who did not see a consultant.

---Diagnosis status at index contact

---Presence or absence of contacts in the episode for which the patient is ineligible for plan coverage.

---Percent of contacts which are in clinic hours
Here, your intent would be to ask whether resource use is more intense for episodes with all contact falling in clinic hours, versus those which had some night or holiday visits.Divide this var. into classes to use it as indep. var.

---Percent of contacts which are regularly scheduled.
Does it make a difference in resource use whether the episode include some vs. no walkin visits?

---Presence or absence of hospital admissions

---Presence or absence of emergency room contacts

---Presence or absence of other types of contacts enumerated in SCVAR 1-7 that are of ibterest for your dieease.

---Percent of episodes with Y00.0, physical exam, as comorbidity.

---Presence or absence of special types of provider in episode, as enumerated in SCVAR8-15.

---Presence or absence of different types of orders to return for care, as enumerated in SMVAR25-40.

—Proportion of episodes in which the patient was instructed to return for further care at the last contact. May be brokendown by year of last contact, or by other means that seem relevant

MEMO 2, P.5

This is a list of suggestions of variables you may wish to examine using BREAKDOWN. This analysis should be rapid and easy; using these results in conjunction with the printout of episode frequencies,you will have:
--a means of deciding whether certain episodes should be discarded from all future analysis.
--guidance on the form each independent variable should take in a multiple regression equation or in an AID run.
--basic information on which independent variables do, and which do not, affect episode resource use.

At a later stage in the analysis, depending on time pressures and the results you got from the AID runs,you may find it useful to use breakdowns for more descriptive data. Suppose that, in this first use of BREAKDOWN, as stated above, you used total clinic contacts and total RVS as dependent variables, and that you found 12 of the 25 variables listed above to have statistically significant influence on resource use. You could take more detailed measures of resource use, such as no. of drugs ordered, or RVS subclasses, as new dependent variables, and run breakdowns on them using the 12 independent variables that you earlier found to be significant.

WHEN YOU DO BREAKDOWNS, USE ONLY ONE DEPENDENT AND ONE INDEPENDENT VARAIBLE. THE BREAKDOWN PROGRAM CAN GIVE RESULTS IF YOU USE MULTIPLE DEPENDENT VARIABLES, BUT THESE RESULTS ARE A TANGLED MESS. NOW THAT WE HAVE AID , WE CAN AVOID THAT TANGLED MESS ENTIRELY.

Further descriptive information can be gotten from FREQUENCIES, CROSSTABS, and PEARSON CORR runs.

IV.DO MULTIVARIATE ANALYSIS.

A. Begin with AID.

The first step is to use AID to show interacting effects of non-utilization patient/MD/system variables, as named in Memo 3 and in the above section in this memo, on resource use. For each run:
--choose one dependent variable, a measure of resource use
--choose up to 36 independent variables. Be sure that all independent variables are independent of each other.
--do NOT include 'percent' independent variables, such as percent of contacts which are phone/letter, or percent of RVS which is lab, etc, unless they have a specific medical meaning.
--consider whether you should eliminate continuing episodes from AID analysis.
--decide how to handle episodes which may be truncated at the end by the end of the study period. If you decide that an episode of disease X does not meet medical criteria for an episode unless it lasts over 3 months, eliminate episodes from your analysis that begin after September 30, 1973.
--For your disease, decide whether to change the stop rules that John used for hypertension and cycstitis.
--be sure the independent variables are in fact independent of the dependent variable.
--state continuous independent variables as categories. Each indep.var. category should have at least 25, and preferably 50, episodes.

The result of this first run should be to isolate which patient/system/MD variables affect resource use, and to show the interaction between them.For step one, each terminal box should include a popualtion which is relatively homogenous with respect to nonutilization characteristics, and with respect to RVS.

MEMO 2, P.6

(For the first step, patient,system, and physician variables should be put together into a single run.)

The second step in the AID process is to use it to define bundles of care. For each run:
--choose one dependent variable, a measure of resource use.
--choose a set of independent variables. All these would be utilization measures. These would include drug classes of interest, lab and xray tests of interest, specific office visits of interest,office procedures of interest,presence or absence of specific types of phone calls of interest (i.e.,drug-realted), presence or absence of specific types of contacts of interest (i.e.,hospitalization, ERvisit, house call),etc.
--Do not use 'percent' variables. Each independent variable should be specific and medically meaningful.

The result of step two in AID will be delineation of several pathways of specific types of utilization, as shown in the sample run attached. In that run, there are 6 sets of people, each with a distinctive bundle of labs, x-rays, and clinic contacts.

Each pathway, as in the example, represents a bundle of care.

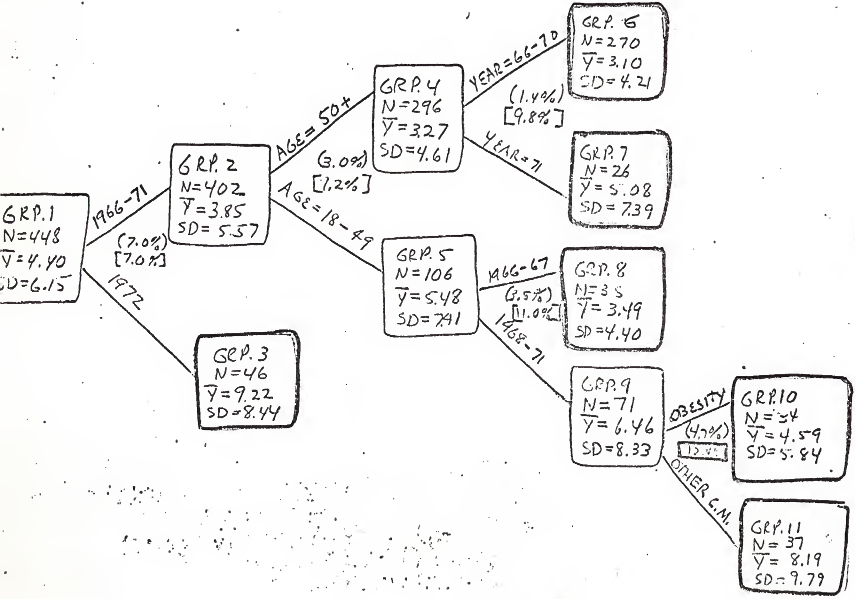
The third step in AID analysis is to determine how people end up with different bundles of care.
--John Mullooly is preparing a log-linear multiple classification analysis. Taking the patient/system/physician characteristics which the first AID run identified as important, the new program will assess how a patient's possession of a given mixture of these characteristics influences the likelihood of ending up with a given bundle of care.
--In addition, it may be useful to get a FREQUENCIES run for each population in the final boxes of the AID utilization run. This would yield descriptive data, with which we could compare age, co-morbidities, etc. for the people in the different boxes.

With the AID program and the log-linear MCA program that John is preparing, we are not likely to need multiple linear regressions, ANOVA runs with two or more independent variables,or large numbers of CROSSTABS.

LINPRO 31-03

Indep.vars: List I ([illegible]e p.4))

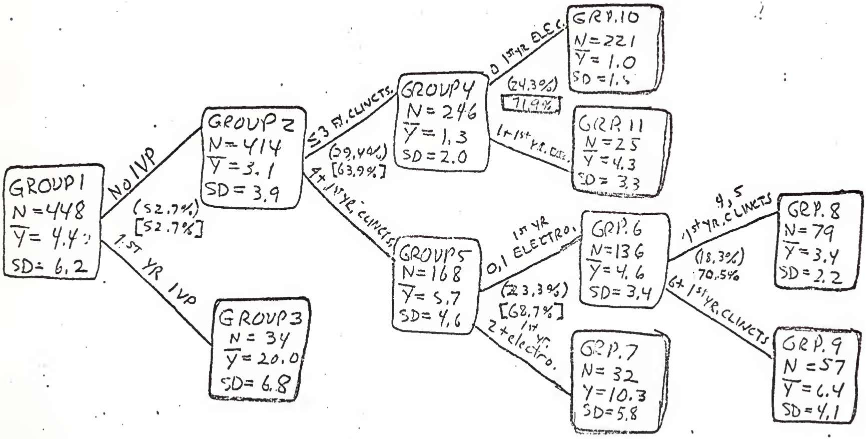
EXAMPLE AID RUN - STEP I
PT/SYSTEM/MD VARS.



EXAMPLE AID RUN - STEP 2
UTILIZATION VARS

LINPRO 35-03

year Total RVS. All eps. dur 1 yr.
Indep. vars LLI III, except that no. of labs & xrays is counted over the first year only, and no. of clin. cts. is counted over the first year only,



INTER-OFFICE MEMORANDUM

TO Episode people
AT
COPIES TO Variable classif.

DATE 5/30/80
FROM Lee
AT

Memo 3 — P. 1, . Var. list

SUBJECT : List of variables that are measures of resource use. These are summary measures, not tied to a specific procedure. Which you use varies by disease.

CONTACT LEVEL--- refers to the contact frequencies file and to the index contact file that is on your episode printout.

U101-total CRVS of lab procedures
U102-total CRVS of xray procedures
U103-total CRVS of surgical office procedures
U104-total CRVS of adult office procedures
U105-total CRVS of pediatric office procedures
U106-No. of special CRVS code(s) in the contact(s)

EPISODE LEVEL
SMVAR 41-No. of lab tests in episode
SMVAR 42-No. of radiology tests this episode
SMVAR 43-No. of drugs ordered this episode
SMVAR 44-Total lab CRVS
SMVAR 45-Total radiology CRVS
SMVAR 46-Total office surgery CRVS
SMVAR 47-Total office adult CRVS
SMVAR 48-Total office peds CRVS
SMVAR 49-Total CRVS this episode
OFFICRVS- office CRVS
LETTCRVS- letter CRVS
PHONCRVS- phone call RVS
OVCRVS- office visit CRVS
OPROCRVS- office procedure RVS
NO. OF DRUG CALLS - May be a proxy for drug use that would cover the whole study period, not just the '72/'73 period for which drug data are available.

For most diseases, the best measures will be:
SMVAR 49
SMVAR 44
SMVAR 45
OVCRVS
OPROCRVS
SMVAR 43
NO. OF DRUG CALLS

Note: For each episode, SMVAR44+45+46+47+48=49
OFFICRVS=LETTCRVS+PHONCRVS+OVCRVS+PHONCRVS=SMVAR46+47+48
SMVAR49=OFFICRVS+SMVAR44+SMVAR45

Other measures of resource use include rates of RVS use per episode year or per episode month, and total RVS use during a critical initial period in your episodes.

Summary counts of contacts which can be used to check results gotten by analysis of RVS use are:
SCVAR 1---No. of hospital admissions
SCVAR 2---No. of clinic contacts
SCVAR 3---No. of visits to patient house
SCVAR 4---No. of visits to nursing home
SCVAR 5---No. of emergency room contacts
SCVAR 6---No. of phone+letter contacts
SCVAR 7---No. of contacts with non-Kaiser MD
SCVAR 37--Total no. of contacts in episode

THESE CONTACT MEASURES, ESPECIALL THOSE OTHER THAN SCVAR2 (OR PERHAPS SCVAR 37), CAN ALSO BE USED AS MEASURES OF THE BUNDLE OF CARE GIVEN IN AN EPISODE.

Of these variables, SCVAR2 is likely to be the best check on RVS-based measures of resource use; SCVAR37 may also be useful, depending on the nature of your disease (i.e., if management of your episodes involves a high proportion of non-clinic contacts.)

INTER-OFFICE MEMORANDUM

To
At
Copies to

Date
From
At

memo 3 — P. 2 Var. List

Subject : LIST OF PATIENT-RELATED VARIABLES,FOR USE AS INDEPENDENT VARAIBLES

U04-Sex
U05-Age at index contact. Or, use AGEGRP.
*U10-At the index contact, is the given morbidity record the presenting morbidity or the 1st through 8th associated morbidity? At the episode level, get at this issue by using PCTPRES, the percent of contacts within the episode in which the disease you are analyzing is the presenting morbidity.
Comorbidity group membership. (I.e., for hypertension, was the episode of htn. accompanied byheart disease, or by obesity, or by diabetes, or by a combination of these, or by none of these?)
Presence or absence of symptoms of interest for your disease--if you created such a variable
New or continuing episode
*U50-No. of comorbisities at the index contact. Or, at the episode level, use the mean number of comorbidities per contact in the entire episode,MNCOMORB.
Depending on your disease, you may use these:
  -No. of morbidities in which your disease was the presenting morbidity for the contact, and was updated to something else.
  -No. of times in the episode that the presenting morbidity was not your disease, and the updated presenting morbidity was your disease.
  -Presence of adverse drug reaction as comorbidity or as updated presenting morbidity within the episode.
Year of first contact , OR episode duration, expressed in days, months, or years

* These may also be treated as system-related variables. If you are doing a run with comorbidity group as an independent variable, it may be necessary to use PCTPRES/U10 and U50/MNCOMORB in a separate run — otherwise, as occurred in hypertension, PCTPRES and MNCOMORB might swamp comorbidity group.

INTER-OFFICE MEMORANDUM

TO

AT

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Memo 3 P. 3 Var. list.

SUBJECT

: LIST OF MD-RELATED VARIABLES

U16-MD number at index contact
U17-MD status at index contact (regular, temporary, or consulting)
MDSERV1- Specialty of attending MD at index contact, or if there are a smaller number of specialty groups which you wish to analyze, lump some of the specialties together and use RMDSERV1.
MDSERV2- Specialty of referring physician at index contact. (May not be needed for most diseases.)
*SCVAR 19-31--No. of times in episode that a patient is seen by an MD of a given specialty.
*SCVAR 32-34--No. of times a patient is seen by regulat attending/temporary attending/ consulting MD in the episode.
Proposed varaible :
--Number of different MDs that the patient sees over the episode. If the patient sees only one MD over the entire episode, we can get at interphysician variance by using MD no. at th index contact as independent varaible.

* This may be used descriptively! If there are 3 MD groupings of interest for your disease - internist, ob-gyn, and all other MDs, you can ask the % of cts. in each ep. seen by internists, % seen by obgyns, % seen by all other providers. Likewise for SCVARS 32-34: if you need it, you can get descriptions: % of cts. where the provider was a consultant, etc.

INTER-OFFICE MEMORANDUM

TO

AT

COPIES TO

Memo 3

DATE

FROM

AT

P.4 - Var. list

SUBJECT : List of system-ralated variables

SCVAR 32-34-No. of contacts in episode that have a diagnosis of tent./unk/estab. status.
U19-Diagnosis status at index contact
U70-Health plan eligibility status at index contact
SCVAR36-no. of contacts in episode at which patient is ineligible for health plan cov.
SCVAR 16- No. of contacts in ep. that were during clinic hours (U14, index ct.)
SCVAR 17- No. of contacts in ep. that were reg. sched. appts.(U15, index ct.)
SCVAR 18- No. of contacts in ep. that were walkin
For descriptive purposes, you may also use the % of contacts that were walkin/reg. sched./ineligible/in clinic hours/ dx. unknown/dx.estab./dx.tentative.

List of utilization variables that can be used as a step in AID analysis:

Drug classes that you specified as of interest- whether or not they were used at the index contact (U82,U85,U88), and/or no. of times they were used in the entire episode, and/or whether or nor they were used in a critical inital period appropriate to your diease.

Lab tests of interest (U57,61,63,67,65, if you need to examine index ct. separately.)

Radiology tests of interest

Specific office visit types (i.e., 9002, 9003, all mental health visits) of interest

Specific office procedures of interest (U26-31, if you need to examine index contact separatel

Specific types of phone calls (i.e., drug-raalted) that are of interest

SCVAR1-7 (but excluding SCVAR 2 if you are using it as a dependent variable)- No. of hospital admissions, clinic contacts,house calls, provider visits to nursing home,ER contacts, phone/letter contacts, non-Kaiser MD contacts. Whether you use any of SCVARS1-7 as independent variables in an AID run will vary with your disease. U12 provides analagous information for the index contact.

SCVAR8-15-No. of contacts in ep. with service given by different types of provider-MD,RN, optometry, etc. U13 gives analogous information for the index contact. (Descrpitively, you may widh to ask the proportion of contacts in each episode which have service given by MDs, other types of providers.)

SMVAR25-40-No. of contacts in which the patient was ordered to return to MD, lab, etc. These are less likely to be useful to you than ohters in this list. Analogous information can be gotten for the index contact by using U32-U49.

Certain other varaibles may be interesting descriptively, but do not belonh in an AID run:% of total episode CRVS acounted for by phone/letter/ov/office proc./lab/rad. (PCTLETT-PCTXRAY), % of contacts with Y00.0 (physical exam) as a co-morbidity, % of contacts which occurred in hospital/clinic/ER/phone+letter, etc.

Another utilization variable which may be useful to create is whether or not the patient is asked to return at the last contact of the episode.

APPENDIX III

EPISODES DEFINITIONS IN DATA SYSTEMS AND RELATED MEMOS

EPISODE

ACUTE

Acute begins at the time of the contact (direct or indirect) where specific morbidity diagnosis is made or updated by subsequent information. Acute conditions are usually considered a new episode when recurrence of condition occurs after 90 days from first service and there is no indication or connotation of continuity. Upper Respiratory Infections are considered new episodes if clearly recurring after 30 days.

Acute conditions are considered recurrent and recorded as initial episodes related by service morbidity number when characterized by physician or patient in terms of continuity (eg. recurrent, persistent) or if clearly related to a previous visit for a condition.

Acute conditions are considered new episodes when there is no indication or mention of continuity and given the clinical nature of the disease, sufficient time has elapsed since the last contact. The timing of the clinical course of the disease requires medical evaluation and should be verified by the medical staff.

CHRONIC

Once experience, all subsequent contacts for the specific condition or complications arising from the condition are related by service morbidity number. If completely corrected by surgery and subsequently recurs, a chronic condition is treated as an initial contact and related by service morbidity number to the original episode number.

New members enrolled in the study with previously established chronic conditions diagnosed outside Kaiser are recorded initial episode for first contact to Kaiser. New members enrolled in the study with conditions documented in the Kaiser medical record before the patient was included on the study will have a continuing episode number to the day before the start of their inclusion on the study. With the terminal digits 01 for the first such disease, 02 for the second such, etc. Thus, for a patient added to the study on 2-1-68 and having a continuing morbidity (from data documented in the Kaiser medical record) would be recorded under episode as 1-30-68 01, or 1-30-68 02, etc.

Episode (col. 46)

Episode pertains to initial visit or continuing visit for a morbidity or condition. Initial visit may be related to a service morbidity number which is defined:

> The episode service morbidity number is the date for the first time a morbidity or condition is diagnosed. Several morbidities, conditions, and complications from a previous coded morbidity are related by the Episode Service Morbidity number being the same.
>
> A continuing Episode will always have a service morbidity number recorded.

Not all diseases and conditions are considered Episodic in this study.

Episode - Predating

All conditions diagnosed in the medical record before the patient became effective on the study will be pre-dated to the day before the service effective date.

A patient became effective 02-68 and has (3) two continuing morbidities.

	Predate	DSN	MN
First Predated Morbidity	01-31-68	0 -	1
Second Predated Morbidity	01-31-68	0 -	2
Third Predated Morbidity	01-31-68	0 -	3

If the Service is related to a morbidity that originated in the hospital, the Episode service morbidity number refers to the hospital admission date (DSN will always be 0).

Code Number	Episode	Definition
1	Initial Visit Code ?	Initial visit for the first occurrence of a new condition or the first appearance of a complication. Recurrence of an acute condition after 3 months will be considered a New Episode (initial visit). Upper Respiratory Infections (URI). will be considered a new episode (initial visit) if clearly recurring after one month. A chronic Disease corrected by Surgery and reoccurs after patient was observed for this condition becomes a new initial episode. but the same morb. No. of the previous occurrance is recorded. Obesity and Pregnancy will not be considered as having the same episode morbidity number, but as having two distinct medical conditions, unless it is clearly obesity of Pregnancy which will be related by the same episode no. Do not relate Eye Diseases (381-389) to Refractive Error (380).
1	Initial Visit and related to a previous episode	Code for a new occurrence of a previous coded morbidity and record the date, DSN(Day Service No.), and MN (Morbidity Number) for that previous coded morbidity. The episode number for complications of a previous coded morbidity will be coded the same for all subsequent services for this complications.

Initial Visit and Related to a previous Episode

Relate the following conditions when they occur together:

- Coryza
- Rhinitis
- Sinusites
- Otitis Media
- Pneumonia

Adverse Effect of a drug is related to the morbidity for which the medication was originally Rx.

A distinct disease such as gout may be produced as an adverse effect of a drug.

Presenting Morbidity	Associated Morbidity
Adverse effect of Drug	Gout

The presence of the same episode number will show the connection between the two morbidities.

All Services ordered from a previous visit will be related in episode.

Immunizations ordered at the time of a Physical Examination will be coded initial visit and related to the episode number of the P.E.

When an immunization is given yearly after the initial series code intial visit and relate to the previous morbidity number for the immunization.

If the ICDA code changes from an initial or continuing episode for a Eye Refraction then code initial visit and relate to the previous refractive episode (prior to 10-09-68 eye refractions were coded continuing from the initial episode).

Pregnancy at Term should be coded initial visit and related to Prenatal Care Episode Number.

Infected Skin Lesions are coded by listing the primary Skin disease as one morbidity and pyoderma as a second morbidity. These two conditions are related by having the same episode service morbidity number.

Dx Infected Sebaceous Cyst

Presenting Morbidity:		Associated Morbidity:	
Morbidity Name	Sebaceous Cyst	Morbidity Name	Pyoderma
ICDA No.	714.2	ICDA N.	698.0
Episode	Initial Visit	Episode	Initial Vi & related Sebaceous Cyst

Continuing Episode

If patient is returning for Secondary Infection (Pyoderma) then code:

Presenting Morbidity	Associated Morbidity
Pyoderma	Skin Disease
698.0	714.2
Cont. Episode same	Cont. Episode

Code Number	Episode	Definition
2	Continuing	Once the patient has experienced a disease then all subsequent services for that illness or condition and all complications arising out of that illness or condition (after the initial visit) are to be recorded as continuing episode. Code continuing episode when the condition has been diagnosed from a previous service recorded in the medical record. Code continuing if the condition is updated from a previous service. Code continuing if the Physician characterizes the condition in terms connoting continuity such as "recurrent" or "persistent".

Coninuing Episode

If the first service for a morbidity is by phone, then the first physician visit is to be recorded as continuing with the same service morbidity number as for the initial phone call (Item F - code #9001 primary procedure number for the initial office visit).

Some I.C.D.A. Diagnosis will change because of a change in the clinical status of the patient rather than in a basic change in the Physician's perception of the illness.

Example:

> Congestive Heart Failure is a state of actual congestive failure at the time the patient was seen. On subsequent visits it may be that the C.H.F. is no longer present although the patient requires continuation of the medication previously Rx. The I.C.D.A. will change from 434.1 (CHF) to 434.8 (Compensated CHF).

The episode will be continuing from the same service morbidity number as coded for C.H.F..

Myocardial Infarction is ICDA coded 420.1. At some point after convalescence the ICDA code changes to 420.2 (healed Myocardial Infarction). This will occur when the physician instructs the patient to return for his next visit in more than a one month period.

A series of immunizations stemming from a single visit will have a continuing episode with the same service morbidity number.

Code Number	Episode	Definition
9	Inapplicable	

MORBIDITY AND ICDA CODE

A Morbidity of Pelvic Inflammatory Disease (P.I.D.) treated with 4.8 million units of a penicillin and also a Rx of Benemid should be coded Gonococcal infection 030.0 with a TENTATIVE Status of Diagnosis. Update morbidity on basis of lab report. /12-18-74

Ocular Hypertension 387.4

Ocular Hypertension should be coded Glaucoma if treated.

A morbidity of Suspect Glaucoma should be coded Ocular Hypertension NOT GLAUCOMA. 12-18-74

INTER-OFFICE MEMORANDUM

To Dr. Hurtado MD
At Sunnyside Medical Center

Date 12-14-76

From Mary Ellen

At Regional Facil

Copies to
File

Subject

DOCUMENTATION - OUTPATIENT STUDY

Patient is on diuretic for Hypertension. Hypokalemia shows up on lab report. Physician calls patient as a result of lab result and gives Rx.

Code Associated Morbidity.....Hypokalemia (Tentative)

Procedure......................1111 (Dx. made from lab result)

Symptoms.......................A960 (Non-Allergic Adverse Effec
A960 Service Effective 01-74

NOTE:
Prior to 01-74 we coded E904 for Non-allergic A.E. of drug for Hypokalemia.

A patient is seen for a cut wrist as a result of Suicide Attempt.

Presenting Morbidity..........Cut Wrist
Associated Morbidity..........Suicide Attempt (324.9)

-6 9-70

INTER-OFFICE MEMORANDUM

To Research Employees
At Regional Facility

Copies to

Date 5/8/78

From Dianne

At

Effective May 4, 1978

Subject

Process of OM - If you have a Dx of Om (391.9 or 391.3) and it becomes a Serous then continue 391.9 or 391.3. Do not code Serous (391.0) initial relate.

Recurrent u.5 9.1 correct (acute OM) by initial & relate

within 2 year period - relate back to the date the Dx. was first acute. All of those inbetween will be initial related. If recurrent and you have an acute initial relate to the recurrent forever unless there isn't one for 2 years.

Chr. OM - If a patient is being carried for Chr. OM and the chronis clears no longer carry Chr. If the Chronic is carried and no clearing inbetween continue the chronic. (60 days If a Chronic is being carried and there is an acute OM initial relate to the chr.

EXAMPLE: If a patient comes in with LOM and is told to return for a followup and upon the followup the patient now has ROM, drop the LOm and carry the ROM initial.

Relate colds to the Chronic and Acute OM's.

If Som become Purulent then initial relate.

OM an

INTER-OFFICE MEMORANDUM

TO Senior investigators, research assistants, data processing, etc.

Research Center

COPIES TO

DATE 30 July 1974

FROM Debbie

AT

SUBJECT Study 1: Episodes and How to Deal with Them--A Guide to the Perplexed

Don has asked me to send this around to all of you who will be including episodic considerations in present and future studies. It is a basic explanation of how and why episodes are coded, and how to interpret them, written by Mitch and Jay Glasser. There will be a prize for the first person who can follow Example 3 through to the bitter end.

Mary Ellen - please read & keep in your files

Example 3 is wrong in several ways and they used the 8th edition ICDA codes for Example 3 in error

all the col. nos. mentioned in here refer to a special analysis tape (#2956)

Check Procedures Related to Specific Users

One general problem alluded to earlier concerns the data recorded on the master tapes at Portland and the variables abstracted from them for specific research purposes. For instance, a situation arose on one tape request when the restriction of a full year's membership in the Plan was applied. The file that was provided excluded, by definition, all Plan member newborns for that period. Such an occurrance well illustrates both the need for checking procedures, and the importance of a data request procedure. Errors are inevitable, but rather embarrassing; an efficient data request procedure should minimize them. It is in this sense that "reliability" was expanded to consider the entire data system process.

In summary, we have found the data to be of good quality in terms of the final data set received. However, the usual problems with large data files and a complex system are encountered. The system, therefore, cannot be appropriately evaluated without keeping both of these dimensions in mind. It is extremely important to produce written documents and examples of the use of the system because of the perishable nature of each individual's memory. A cumulative record and documentation of specific aspects of the system will result in an overall improvement in the general retrieval qualities of the entire system.

An Introductory Guide to Understanding the Way and Individual's Utilization Pattern is Linked Across Records in the Kaiser Data Files

The Kaiser data system has been structured to provide information to facilitate research on a diverse set of utilization questions. Studies on the etiology of a particular disease syndrome in time, cross sectional studies on utilization in defined subgroups, and an individual's total utilization patterns are examples of these differing perspectives. Each requires data of a particular nature. The data system exists solely to support these and other studies and the files are so structured. The data system is complex. The rationale helps to put the system into perspective. This exposition is designed to illustrate the structure and its relation to the tracking of an individual's utilization experience through this record system.

A method of such linkage is provided for in the Kaiser files, but the ability to trace a patient's records, disease by disease over time, is crucially dependent on a thorough understanding of these elements of coded data:

1) Date of Service (D.S.
2) Day's Service Number (D.S.#)
3) Morbidity Number (M.#)
4) Presenting or Associated Morbidity (P. or A.M.)
5) Updated Presenting or Associated Morbidity (U.P.orA.M.)
6) Episode (E.)
7) Service Morbidity Number (S.M.#)

The Date of Service is in YYMMDD format, and specifies the date the services noted on a particular record were rendered. In this context a "service" could be anything from a letter, phone call, a change in medication, to an actual surgical procedure.

The Day's Service Number is a single-digit number with these meanings:

1-5	identifies the ordinal number of the service rendered to the patient on that day.
6	physician has cancelled appointment.
7	patient failed to keep scheduled appointment.
8	patient has cancelled appointment.
0	when Form A (primary outpatient source document) is used for inpatient admission to Bess Kaiser Hospital or E.C.F.

A Presenting Morbidity is that which brought the patient into the contact with the system, and is entirely dependent on the patient's perception of his own health status. It is not connected, then, to any ordering of "seriousness" of illness, and in retrospect can be quite trivial. An Associated Morbidity is any other condition treated during the same visit. The recognition and order of treatment of Associated Morbidities is therefore dependent on the physician's perception of and regard for such conditions.

The Morbidity Number records those data and the codes are:

1	Presenting morbidity
2	First associated morbidity

3 Second associated morbidity

.

.

.

9 Eighth associated morbidity

0 Did not keep appointment

The Presenting or Associated Morbidity names via the International Classification of Diseases, Adapted or the Kaiser Project Symptom Codes, the specific morbidity being itemized in a particular record. If the Morbidity Number is "1", then the Presenting Morbidity is the one being documented; if the Morbidity Number is "2", then the First Associated Morbidity is being documented, and so on.

The Updated Presenting or Associated Morbidity follows the same scheme as the Presenting or Associated Morbidity, but records a change in the original diagnosis. It represents an update in the judgment of a medical condition, usually to a more refined or precise statement of the problem based on tests, further examination, or subsequent medical evaluation. It is important to note here that no matter how many updates occur, neither the original denotation of the condition, nor the chain of reevaluation is ever lost from a patient's records.

The Episode code is a single-digit number with these possibilities:

1 Initial visit

2 Continuing

3 Inapplicable

and refers only to the morbidity being documented in that record.

A recurrance of an acute condition will be coded "1" if, given the nature of the condition, sufficient time has elapsed between the anticedent and present visit. In general, recurrence of an acute condition after 3 months will be considered a new episode. URI's, however, will be considered a new episode if clearly recurring after 1 month.

For the several diseases defined as chronic by the Kaiser (Portland) standards, once a patient has experienced any of those diseases all subsequent visits for that condition are recorded as "2". If a chronic disease is completely corrected by surgery and recurrs, that recurrence constitutes an initial episode ("1"), but the Service Morbidity Number of the previous occurrance is recorded.

The Service Morbidity Number is an intricate construct that is the prime key to tracing patients' records over time. It is a combination of the Date of Service of the initial visit for the morbidity being documented in a record, the Day's Service Number of the initial visit for that morbidity, and the Morbidity Number of the initial visit for that morbidity. The Service Morbidity Number is eight digits long in this format:

DIGIT	CONTENT
1-6	MMDDYY, Date of Service of initial visit for a morbidity.
7	Day's Service Number of initial visit for that morbidity.
8	Morbidity Number of initial visit for that morbidity.

Not coded but entered Ht. or [illegible] program Check 2956 tape

When the KHSRC first began to construct these records, the Service Morbidity Number for the initial visit for a new morbidity was coded 99999999. As of October 1968, however, the S.M.# began to be coded as the Date of Service, Day's Service Number and Morbidity Number for the initial visit of that new morbidity. In other words, the initial D.S.N. now records the same information found earlier in the same record.

Thus, all of records of a patient's service for a particular morbidity are linked to the initial service for that morbidity, and can be followed over time using primarily the Episode Number, Updated Morbidity Code, and Service Morbidity Number.

The seven elements appear in the Outpatient Records in the same order as they are listed above, in the indicated columns lengthwise across the page:

ELEMENT	COLUMNS	
Date of Service	29	34
Day's Service Number	35	
Morbidity Number	36	
Presenting or Associated Morbidity	46	50
Updated Presenting or Associated Morbidity	52	56
Episode	57	
Service Morbidity Number	58	65

A schematic of them would look like this:

D.S. D.S.# M.# P. or A.M. U.P. or A.M. S.M.#

Please remember that each record begins with a Data Set number and an HPID number, and can fill up with numbers two full lines of standard computer print-out paper. We are going to examine the relationships of only the seven variables herein under discussion.

Example 1

For openers, the representation of the record for the initial visit for measles (85.0) on July 12, 1968 would look like this:

(D.S.)	(D.S.#)	(M.#)	(P. or A.M.)	(U.P. or A.M.)	(E.)	(S.M.#)
680712	1	1	0850	0850	1	07126811

Note, please, that the formats of the D.S. and date section of the S.M.# are different.

If the patient returned a week later and was treated only for the same case of measles, the numbers would be:

680719	1	1	0850	0850	2	07126811

Notice that the Episode code now indicates a continuing episode, and that the S.M.# refers back to the initial visit for this morbidity.

If the patient returns three days later because of non-specific tonsillitis (430.0) and then was examined for his measles, the records would read:

680722	1	1	4730	4730	1	07226811
680722	1	2	0850	0850	2	07126811

The D.S.# would be "1" on both records because each record would document only the first service performed for each morbidity. Second, third, etc. services would be likewise documented. The measles E. is again "2", indicating a continuing episode for that condition.

Example 2

A patient arrives on August 7, 1970 to be treated for a stroke of unknown origin (335.1); his record is:

700807	1	1	3351	3351	1	08077011

After some tests later that day, it is determined that the stroke was caused by an hemorrhage (331.0). The patient's record is then changed to:

700807	1	1	3351	3310	1	08077011

A week later the patient returns for treatment, and the record reads:

770714	1	1	3310	3310	2	08077011

The U.P.M. of the previous visit has become the P.M. for this visit; the S.M.#, however, refers us back to the original visit for this ailment.

At a visit two weeks later and after still further tests, the diagnosis is again updated, this time to stroke caused by embolus (332.0). The record for this visit reads:

770828	1	1	3310	3320	2	08077011

and his past records are updated to reflect the new diagnosis. All of the patient's records for this condition now look like this:

700807	1	1	3351	3320	1	08077011
700814	1	1	3310	3320	2	08077011
700828	1	1	3320	3320	2	08077011

Example 3

Multiple services for multiple conditions generate somewhat more complicated records. Consider a patient with the following established conditions:

Condition	ICDA	S.M.#
Pulmonary Tuberculosis active, minimal	011.0	09146911
Chirrosis of the Liver, alcoholic	517.0	09146912

In other words, on September 14, 1969 the patient was first treated for those conditions, tuberculosis being the Presenting Morbidity and chirrosis the First Associated Morbidity. On December 6, 1969 he came in to be treated for a sore, inflamed, abscessed toe, diagnosed as cellulitis (681), and was also examined for his existing condition; the records read:

691206	1	1	6810	6810 injection	1	12066911
691206	1	2	0110	0110 TB	2	09146911
691206	1	3	5710	5710	2	09146912

During the examination for chirrosis a condition of chronic appendicitis (542) is discovered, generating this record:

691206	1	4	5420	5420	1	12066914

Surgery for the appendicitis is performed:

691206	2	4	5420	5420	2	12066914

Later, chemotherapy for the tuberculosis necessitates a trip to the injection clinic:

691206	2	2	0110	0110	2	09146911

and therapy is prescribed for the chirrosis:

691206	2	3	5710	5710	2	09146912

The results of the examination of the celluitis are returned, and two discoveries are made. Firstly, the condition is present in less acute form over most of the patient's lower extremities, and secondly, that the cellulitis is directly related to impared liver function caused by the chirrosis. The Updated Presenting Morbidity then becomes 682.9, and the Service Morbidity Number is changed on all appropriate records to relate the cellulitis to the chirrosis. The abscess is drained, and this last record now reads:

691206	2	1	6810	6829	2	09146912

All of the patient's records for that day read:

691206	1	1	6810	6829	1	09146912
691206	1	2	0110	0110	2	09146911
691206	1	3	5710	5710	2	09146912
691206	1	4	5420	5420	1	12066914
691206	2	1	6810	6829	2	09146912
691206	2	2	0110	0110	2	09146911
691206	2	3	5710	5710	2	09146912
691206	2	4	5420	5420	2	12066914

Thusly, one can study the histories of patient conditions or the courses of physicians' perception or treatments over time. Liberties have, of course, been taken with the time frames and the medical realities of these events, but only for the sake of the examples. Same-day multiple services for multiple conditions are complicated and intricate, but their analysis is illuminating pursuit and well within the structural limits of the Kaiser Data Files.

Item B

Status of Diagnosis (col.41)

Status of Diagnosis pertains to the Morbidity Name recorded in Item A for each Morbidity recorded.

Code No.	Status of Phy.	Definition
1	Unknown	Code unknown if a symptom (T code) is recorded in Item A. Code the symptom (T code) in item A if two or more diagnosis are ruled out(R/O). Unknown Diagnosis (ICDA No. 795.9). No Disease Present (000.0).
2	Tentative	Code tentative if the Physician notes the following terms before or after the diagnosis: Suspected Possible R/O Rule-Out ? All new diagnosis made by telephone or letter will be coded tentative. Functional Diagnosis except non-organic will be coded tentative. A new Morbidity found from Lab or X-ray tests will be coded tentative.
3	Established	Established is coded if the Physician treats, orders Rx, or refers patient (consultant) for a morbidity. Code established for the following morbidities: Newborn Pregnancy Delivered Postpartum Exam. Social Problems Rx for Beestings Y02.1
4	Inapplicable	Inapplicable is coded when the ICDA number coded in Item A indicates that no morbidity is

4	Inapplicable	present which includes the following: Pelvic Exams Well Child Care (WCC) Eye Refractions & Eye exams Service for Oral Contraceptives Immunizations Notations without a Morbidity Phone Call without a Morbidity Letter without a Morbidity Unknown Morbidity (000.1)

CHRONIC CONDITIONS

The following conditions are considered Chronic:

- Chronic cystitis
- Depression
- Neoplasms (Malignant, Benign, & unspecified)
- Obesity
- Diabetes
- Hypertension, Essential
- Migraine headache

TO:Episode people

From:Lee

Re: Revised analysis protocol, based on ep. meeting discussion

6/19/80

Memo I

OBJECTIVES OF PHASE I REPORT

1. Define the condition which you are analyzing, and explain how you use the concept of "episode of care".
2. Describe the population being analyzed. (Age, sex, comorbidities, etc.)
3. Describe how patient-related, system-related, and physician-related variables influence total resource use in diagnosis and/or treatment of your condition.(Resource use refers to summary measures of utilization: total RVS and the subclasses of RVS, total no. of contacts, no. of clinic contacts.)
   This analysis should include:
   --Bivariate analysis, examining resource use as a function of each separate patient/system/physician variable. Aims: description of patterns of resource use, isolation of key variables for further analysis, and clarification of how to proceed in multivariate analysis.Use BREAKDOWN, CROSSTABS, PEARSON CORREL.
   --Multivariate analysis Patient/system/MD variables should be independent variables, with total resource use measures as the dependent variables in AID runs.
4. Using AID, identify bundles of care for your condition. (Bundles of care refers to the mix of procedures -- lab tests, x-rays, drug orders of a given type, hospitalizations, office procedures, office visits-- used to manage a given episode. These should be the procedures which were counted separately as procedures of interest on your episode file.)
5. Using AID, John's log-linear multiple classification program (hereafter referred to as LLMCP), and frequencies or breakdowns, describe how patient, system, and MD characteristics influence the likelihood of receiving a given bundle of care. Bundles of care may refer to diagnosis and/or treatment.
6. With the help of a memo to come from Jane and me later this summer, value alternative bundles of care in dollar price of the bundle on the market, and in dollar cost to the system of producing the bundle, as well as in RVS units.
7. Decide whether you recommend your condition for Phase II analysis; a final decision will be made by the team once all disease reports are done.

8. Outcome, quality of care, input substitution within and between bundles will be discussed in a general essay, not handled in disease-by-disease reports.

Cover letter/summary of memo 2

SUBJECT : SUMMARY OF INSTRUCTIONS ON HOW TO HANDLE YOUR PRINTOUT

Follow these steps:

I--Upon receiving the episode printout, examine it for errors, discrepancies, and missing information.

II--Decide which measures of resource use are appropriate for analysis of your condition.

1. Will you examine the behavior of a subclass of RVS, such as lab RVS, or will you examine only total RVS?
2. Will you examine the behavior of total clinic contacts, or other counts of the number of contacts (SCVAR1-7,37), in addition to examining RVS measures?
3. Will you use rates of resource use or total resource use as a dependent variable?
4. Within the episode, do you wish to examine an initial workup period in addition to examining the entire episode?
5. Do you need the calendar file?
6. Do you need to distinguish between new and continuing episodes?

III-Do bivariate analysis of the data, with resource use measure(s) taken as the dependent variable(s), and with each patient/system/physician variable taken separately as an independent variable. Use BREAKDOWN, FREQUENCIES, CROSSTABS, AND PEARSON CORR as needed.

IV--Do multivariate analysis of the data. Use AID to examine how patient/system/physician variables interact to influence total resource use. Use AID, with resource use as a dependent variable, and with utilization measures as an independent variable, to define bundles of care. Use John Mullooly's log-linear multiple classification analysis to determine how patient/system/physician characteristics influence the probability of a patient getting a given bundle of care.

V--Seek other data which may be needed to describe the population and the episodes you are studying, and to meet the objectives of the Phase I report.

Memo 3 is a classification of which variables fall into which classes: patient characteristics, system characteristics, physician characteristics, and measures of resource utilization. It is a follow-up on team suggestions that we develop a common nomenclature for variables.

INTER-OFFICE MEMORANDUM

To

At

Copies to

Date

From

At

MEMO 2, P. 1

Subject : THE GORY DETAILS--HOW TO HANDLE YOUR PRINTOUT

I--UPON RECEIVING THE EPISODE PRINTOUT, EXAMINE IT FOR ERRORS, DISCREPANCIES, AND MISSING INFORMATION.

Look for these possible problems:
-Subtotals of RVS do not add up to total RVS .
-Subtotals of specific types of contacts do not add up to total contacts--if you specified such variables.
-Duration of episode, or mean number of comorbidities per contact in the episode, or other computed variables yield outlandish results, or results totally unexpected from inspection of the contact file.
-Error or confusion in labeling variables.
-Failure to create variables which you specified in your data request.

DO be sure to check the program at the front of your printout, to be sure that computed varaibles were created that have the meaning which you intended when you requested them.

Clear communication with Marilyn on what you want when asking for extra episode level variables, or when making an analysis request, will save you both much delay and toil.

II-DECIDE WHICH MEASURES OF RESOURCE USE ARE APPROPRIATE FOR ANALYSIS OF YOUR CONDITION.

1. Will you examine the behavior of a sub-class of RVS, such as lab RVS or office procedure RVS, or will you examine only total RVS?

   Examination of the share oftotal RVS which is accounted for by the subclasses of RVS, variables PCTLETT-PCTXRAY, will show which RVS classes contribute most to total RVS. This, with knowledge of medical decisions to be made in managing your condition, should help you decide whether to examine only total RVS as a measure of resource use, or to also examine lab, xray,etc. RVS subclasses.

2. Will you examine the behavior of total clinic contacts, or other counts of the number of contacts(SCVAR1-7,37) , as a dependent variable?

   If a disease has many co-morbidities,the chances increase that services performed at that contact will have their RVS units coded to another condition. This may skew total RVS as a measure of resources used in managing your condition. If so, it is useful to examine SCVAR2, total clinic contacts, as a measure of total resource use to check and supplement SMVAR49,total RVS.Ask whether these two summary measures act similarly under the influence of age/sex/morbidity group/ other patient/MD/system variables of interest.

3. Will you use rates of resource use or total resource use as a dependent variable?

   If your disease is chronic, with episode lengths ranging from one contact to

INTER-OFFICE MEMORANDUM

To

At

Copies to

Date

From

At

MEMO 2, P2

Subject

seven years,use rates of resource use per unit of time in the episode as your dependent variable. The characteristics of your disease dictate whether you examine RVS per week, month, 6 months, or per year;examine the DURATION variable in your file. An acute condition, for which all episodes are brief and of standard length, may be analyzed using either total RVS, etc., per episode, or by examining total RVS per week of the diease episode.

4. Within the episode, do you wish to examine an initial workup period as well as the entire episode?

Your disease may be one in which the first contact, or first week, or first month, or first year will call forth a different bundle of care and/or a different level of total resource use than the episode as a whole. If you have medical reason to think that this is the case, you should ask that measures of total resource use and/or measures of the bundle of care given be counted separately for the critical period as well as for the entire episode.

5. Do you need the calendar file? Applies only to chronic conditions.

Calendar file information has been obtained for obesity, depression, and hypertension. Investigators should consider whether this is necessary for other chronic diseases in Phase I.Calendar file information has two purposes:
1. Adjustment of rates of resource use per episode year, so that this rate is calculated only for months during the episode for which the patient is eligible for Health Plan coverage.
2. Determination of the gap between the final episode contact and the end of patient eligibility for coverage (if this occurred on or before 12/73), and determination of the gap between the last contact and the end of the end of the study period.

6. DO you need to distinguish bwtween new and continuing episodes?

Is there medical reason to think that a patient who appears at Kaiser with your disease as a pre-existing condition will get a different bundle of care or a different level of RVS use than somebody else with the same disease who has that illness diagnosed for the first time within the system? If so, you may want to get a list of cases from Marilyn, which will specify each case as new or continuing. You could then check this list against the morbidity record printout, to determine whether or not the computer was right in labeling a given episode as new or as continuing.(When I did this check for hypertension, I found numerous episodes in which the classification needed to be changed.)

MEMO 2, P. 3

III. DO A BIVARIATE ANALYSIS OF THE DATA, WITH THE CRITICAL RESOURCE USE MEASURE(S) AS THE DEPENDENT VARIABLE(S), AND WITH EACH PATIENT/SYSTEM/ MD VARIABLE TAKEN SEPARATELY AS AN INDEPENDENT VARIABLE.

Do bivariate analysis of resource use. This is an initial fishing expedition, so examine either total RVS or rates of total RVS. If you have identified one or two other critical resource use measures, use them too at this stage as dependent variables.

Below is a list of episode-level varaibles which can be used as independent variables; choose those which are appropriate for your disease and population. Each subclass of your independent variables should have a population of at least 25 .

For each dependent variable that you choose, ask for a BREAKDOWN run of that variable as a function of these patient/provider/system variables:

---Agegroup at index contact.

Suppose you have 3 age groups: 18-34, 35-49, and 50+. With BREAKDOWN, you will get the mean resource use for people in each age group, and a standard deviation, and the number of people in each age group. Use of the standard deviation, or the calculation of the standard error of the mean for each age group, will enable you to tell whether, taken alone, the age groups you chose are predictive of resource use.

POINTER: You may be undecided whether to use a 3, 4, or N-class age group. If you do a BREAKDOWN on the two or three age groupings that you have in mind, you will be able to tell whether the two or three ways of grouping by age tell the same story in resource use patterns.If a 3-class age grouping and a 4,5,or 10-class age grouping reveal similar patterns of resource use with age, use the age grouping with the smallest number of subclasses for the remainder of your analysis.Likewise, if you initially created only 1 agegroup varaible, with three classes, and this BREAKDOWN reveals that two adjacent classes have similar resource use, and one is significantly higher than the other two, then create a new agegroup variable with only 2 classes. One class would be a combination of the two similar age classes in your first agegroup variable, and the other would be the standout age class. The rationale is that the analysis becomes more tedious and cumbersome with each extra cell you create.Creating unneeded cells will add markedly to your workload in preparing the report.Use this BREAKDOWN step as, among other things, a way to cut the number of cells in key variables.

----Co-morbidity group.

Be sure to create morbidity groups that are mutually exclusive and which taken together, include all the episodes in the population you wish to analyze.Create as few morbidity groups as is reasonable for your set of episodes. Again, the aim is to cut the number of cells you must analyze.

---Sex, if relevant to your population/disease.

---PCTPRES, the % of contacts in your episode in which your disease is the presenting morbidity for the contact. This is a continuous varaible which should have its values grouped into classes to be used with BREAKDOWN. This same advice holds for other continuous varaibles, including others such as PCTLETT-PCTXRAY.

---Presence or absence of symptoms of interest, if you created such a variable

---Presence or absence of adverse drug reaction in the episode, if you created such a variable.

---New versus continuing episodes

---Either MNCOMORB, the mean number of comorbidities per contact, (if your disease is chronic) or U50, no. of comorbidities in the index contact, if your episode is acute.
---Year of index xontact
---Episode duration, expressed in appropriate time units and divided into subclasses.
---MD specialty at index contact, if your disease is acute
---MD number at index contact.

Under certain conditions, this can be used as a way to measure interphysician variation in resource use. Marilyn can flag episodes in which the doctor at the index contact is the only provider that the patient saw throughout the entire episode. For these single-doctor episodes, a frequencies run of variable U16 will show how many times each provider handled episodes of your condition. You can then choose the specific doctors of a given specialty who saw over 20 (and preferably over 50) cases of your condition, and do a BREAKDOWN run, using those doctor numbers as an independent variable. The ETA-squared statistic will show the proportion of the total variation in resource use for those episodes that is statistically explained by the individual doctor.

---MD status at index contact
---Specialty over the episode.(derive from SCVR19-SCVAR31)
You may find, that in SCVAR19-31, most MD contacts for your disease are with internists, and that 20% of contacts over the whole episode are with other specialties. You may wish to ask whether the mean total RVS use for patients with disease X is different for those who saw only internists in their episode than it is for those whose episodes included at least one visit to an MD of another specialty.
---MD status over the episode (derive from SCVAR 32-34)
Here, you may wish to ask whether mean RVS use is significantly different for those whose episodes included a visit to a consultant than for those who did not see a consultant.
---Diagnosis status at index contact
---Presence or absence of contacts in the episode for which the patient is ineligible for plan coverage.

---Percent of contacts which are in clinic hours
Here, your intent would be to ask whether resource use is more intense for episodes with all contact falling in clinic hours, versus those which had some night or holiday visits.Divide this var. into classes to use it as indep. var.
---Percent of contacts which are regularly scheduled.
Does it make a difference in resource use whether the episode include some vs. no walkin visits?
---Presence or absence of hospital admissions
---Presence or absence of emergency room contacts
---Presence or absence of other types of contacts enumerated in SCVAR 1-7 that are of ibterest for your dieease.
---Percent of episodes with Y00.0, physical exam, as comorbidity.
---Presence or absence of special types of provider in episode, as enumerated in SCVAR8-15.
---Presence or absence of different types of orders to return for care, as enumerated in SMVAR25-40.
—Proportion of episodes in which the patient was instructed to return for further care at the last contact. May be brokendown by year of last contact, or by other means that seem relevant

MEMO 2, P.5

This is a list of suggestions of variables you may wish to examine using BREAKDOWN. This analysis should be rapid and easy; using these results in conjunction with the printout of episode frequencies, you will have:

--a means of deciding whether certain episodes should be discarded from all future analysis.

--guidance on the form each independent variable should take in a multiple regression equation or in an AID run.

--basic information on which independent variables do, and which do not, affect episode resource use.

At a later stage in the analysis, depending on time pressures and the results you got from the AID runs, you may find it useful to use breakdowns for more descriptive data. Suppose that, in this first use of BREAKDOWN, as stated above, you used total clinic contacts and total RVS as dependent variables, and that you found 12 of the 25 variables listed above to have statistically significant influence on resource use. You could take more detailed measures of resource use, such as no. of drugs ordered, or RVS subclasses, as new dependent variables, and run breakdowns on them using the 12 independent variables that you earlier found to be significant.

WHEN YOU DO BREAKDOWNS, USE ONLY ONE DEPENDENT AND ONE INDEPENDENT VARAIBLE. THE BREAKDOWN PROGRAM CAN GIVE RESULTS IF YOU USE MULTIPLE DEPENDENT VARIABLES, BUT THESE RESULTS ARE A TANGLED MESS. NOW THAT WE HAVE AID, WE CAN AVOID THAT TANGLED MESS ENTIRELY.

Further descriptive information can be gotten from FREQUENCIES, CROSSTABS, and PEARSON CORR runs.

IV. DO MULTIVARIATE ANALYSIS.

A. Begin with AID.

The first step is to use AID to show interacting effects of non-utilization patient/MD/system variables, as named in Memo 3 and in the above section in this memo, on resource use. For each run:

--choose one dependent variable, a measure of resource use

--choose up to 36 independent variables. Be sure that all independent variables are independent of each other.

--do NOT include 'percent' independent variables, such as percent of contacts which are phone/letter, or percent of RVS which is lab, etc, unless they have a specific medical meaning.

--consider whether you should eliminate continuing episodes from AID analysis.

--decide how to handle episodes which may be truncated at the end by the end of the study period. If you decide that an episode of disease X does not meet medical criteria for an episode unless it lasts over 3 months, eliminate episodes from your analysis that begin after September 30, 1973.

--For your disease, decide whether to change the stop rules that John used for hypertension and cycstitis.

--be sure the independent variables are in fact independent of the dependent variable.

--state continuous independent variables as categories. Each indep.var. category should have at least 25, and preferably 50, episodes.

The result of this first run should be to isolate which patient/system/MD variables affect resource use, and to show the interaction between them. For step one, each terminal box should include a popualtion which is relatively homogenous with respect to nonutilization characteristics, and with respect to RVS.

MEMO 2, P.6

(For the first step, patient,system, and physician variables should be put together into a single run.)

The second step in the AID process is to use it to define bundles of care. For each run:
--choose one dependent variable, a measure of resource use.
--choose a set of independent variables. All these would be utilization measures. These would include drug classes of interest, lab and xray tests of interest, specific office visits of interest,office procedures of interest,presence or absence of specific types of phone calls of interest (i.e.,drug-realted), presence or absence of specific types of contacts of interest (i.e.,hospitalization, ERvisit, house call),etc.
--Do not use 'percent' variables. Each independent variable should be specific and medically meaningful.

The result of step two in AID will be delineation of several pathways of specific types of utilization, as shown in the sample run attached. In that run, there are 6 sets of people, each with a distinctive bundle of labs, x-rays, and clinic contacts.

Each pathway, as in the example, represents a bundle of care.

The third step in AID analysis is to determine how people end up with different bundles of care.
--John Mullooly is preparing a log-linear multiple classification analysis. Taking the patient/system/physician characteristics which the first AID run identified as important, the new program will assess how a patient's possession of a given mixture of these characteristics influences the likelihood of ending up with a given bundle of care.
--In addition, it may be useful to get a FREQUENCIES run for each population in the final boxes of the AID utilization run. This would yield descriptive data, with which we could compare age, co-morbidities, etc. for the people in the different boxes.

With the AID program and the log-linear MCA program that John is preparing, we are not likely to need multiple linear regressions, ANOVA runs with two or more independent variables,or large numbers of CROSSTABS.

INTER-OFFICE MEMORANDUM

TO Episode people

AT

DATE 5/30/80

FROM Lee

COPIES TO Variable classif.

AT

Memo 3 — P. 1, . Var. list

SUBJECT : List of variables that are measures of resource use. These are summary measures, not tied to a specific procedure. Which you use varies by disease.

CONTACT LEVEL--- refers to the contact frequencies file and to the index contact file that is on your episode printout.

u101-total CRVS of lab procedures
U102-total CRVS of xray procedures
U103-total CRVS of surgical office procedures
U104-total CRVS of adult office procedures
U105-total CRVS of pediatric office procedures
U106-No. of special CRVS code(s) in the contact(s)

EPISODE LEVEL
SMVAR 41-No. of lab tests in episode
SMVAR 42-No. of radiology tests this episode
SMVAR 43-No. of drugs ordered this episode
SMVAR 44-Total lab CRVS
SMVAR 45-Total radiology CRVS
SMVAR 46-Total office surgery CRVS
SMVAR 47-Total office adult CRVS
SMVAR 48-Total office peds CRVS
SMVAR 49-Total CRVS this episode
OFFICRVS- office CRVS
LETTCRVS- letter CRVS
PHONCRVS- phone call RVS
OVCRVS- office visit CRVS
OPROCRVS- office procedure RVS
NO. OF DRUG CALLS - May be a proxy for drug use that would cover the whole study period, not just the '72/'73 period for which drug data are available.

For most diseases, the best measures will be:

SMVAR 49	OPROCRVS
SMVAR 44	SMVAR 43
SMVAR 45	NO. OF DRUG CALLS
OVCRVS	

Note: For each episode, SMVAR44+45+46+47+48=49
OFFICRVS=LETTCRVS+PHONCRVS+OVCRVS+PHONCRVS=SMVAR46+47+48
SMVAR49=OFFICRVS+SMVAR44+SMVAR45

Other measures of resource use include rates of RVS use per episode year or per episode month, and total RVS use during a critical initial period in your episodes.

Summary counts of contacts which can be used to check results gotten by analysis of RVS use are:

SCVAR 1---No. of hospital admissions
SCVAR 2---No. of clinic contacts
SCVAR 3---No. of visits to patient house
SCVAR 4---No. of visits to nursing home
SCVAR 5---No. of emergency room contacts
SCVAR 6---No. of phone+letter contacts
SCVAR 7---No. of contacts with non-Kaiser MD
SCVAR 37--Total no. of contacts in episode

THESE CONTACT MEASURES, ESPECIALLY THOSE OTHER THAN SCVAR2 (OR PERHAPS SCVAR 37), CAN ALSO BE USED AS MEASURES OF THE BUNDLE OF CARE GIVEN IN AN EPISODE.

Of these variables, SCVAR2 is likely to be the best check on RVS-based measures of resource use; SCVAR37 may also be useful, depending on the nature of your disease (i.e., if management of your episodes involves a high proportion of non-clinic contacts.)

INTER-OFFICE MEMORANDUM

To

At

Copies to

Date

From

At

memo 3 — P. 2 Var. List

Subject : LIST OF PATIENT-RELATED VARIABLES,FOR USE AS INDEPENDENT VARAIBLES

U04-Sex
U05-Age at index contact. Or, use AGEGRP.
*U10-At the index contact, is the given morbidity record the presenting morbidity or the 1st through 8th associated morbidity? At the episode level, get at this issue by using PCTPRES, the percent of contacts within the episode in which the disease you are analyzing is the presenting morbidity.
Comorbidity group membership. (I.e., for hypertension, was the episode of htn. accompanied byheart disease, or by obesity, or by diabetes, or by a combination of these, or by none of these?)
Presence or absence of symptoms of interest for your disease--if you created such a variable
New or continuing episode
*U50-No. of comorbisities at the index contact. Or, at the episode level, use the mean number of comorbidities per contact in the entire episode,MNCOMORB.
Depending on your disease, you may use these:
- No. of morbidities in which your disease was the presenting morbidity for the contact, and was updated to something else.
- No. of times in the episode that the presenting morbidity was not your disease, and the updated presenting morbidity was your disease.
- Presence of adverse drug reaction as comorbidity or as updated presenting morbidity within the episode.

Year of first contact , OR episode duration, expressed in days, months, or years

* These may also be treated as system-related variables. If you are doing a run with comorbidity group as an independent variable, it may be necessary to use PCTPRES/U10 and U50/MNCOMORB in a separate run — otherwise, as occurred in hypertension, PCTPRES and MNCOMORB might swamp comorbidity group.

INTER-OFFICE MEMORANDUM

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Memo 3 P. 3 Var. list.

Subject

: LIST OF MD-RELATED VARIABLES

U16-MD number at index contact

U17-MD status at index contact (regular, temporary, or consulting)

MDSERV1- Specialty of attending MD at index contact, or if there are a smaller number of specialty groups which you wish to analyze, lump some of the specialties together and use RMDSERV1.

MDSERV2- Specialty of referring physician at index contact. (May not be needed for most diseases.)

*SCVAR 19-31--No. of times in episode that a patient is seen by an MD of a given specialty.

*SCVAR 32-34--No. of times a patient is seen by regulat attending/temporary attending/ consulting MD in the episode.

Proposed varaible :

--Number of different MDs that the patient sees over the episode. If the patient sees only one MD over the entire episode, we can get at interphysician variance by using MD no. at the index contact as independent varaible.

* This may be used descriptively: If there are 3 MD groupings of interest for your disease – internist, ob-gyn, and all other MDs, you can ask the % of cts. in each ep. seen by internists, % seen by obgyns, % seen by all other providers. Likewise for SCVARS 32-34: if you need it, you can get descriptions: % of cts. where the provider was a consultant, etc.

INTER-OFFICE MEMORANDUM

To

At

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Memo 3

Date

From

At

P. 4 - Var. list

Subject

: List of system-ralated variables

SCVAR 32-34-No. of contacts in episode that have a diagnosis of tent./unk/estab. status.
U19-Diagnosis status at index contact
U70-Health plan eligibility status at index contact
SCVAR36-no. of contacts in episode at which patient is ineligible for health plan cov.
SCVAR 16- No. of contacts in ep. that were during clinic hours (U14, index ct.)
SCVAR 17- No. of contacts in ep. that were reg. sched. appts.(U15, index ct.)
SCVAR 18- No. of contacts in ep. that were walkin
For descriptive purposes, you may also use the % of contacts that were walkin/reg. sched./ineligible/in clinic hours/ dx. unknown/dx.estab./dx.tentative.

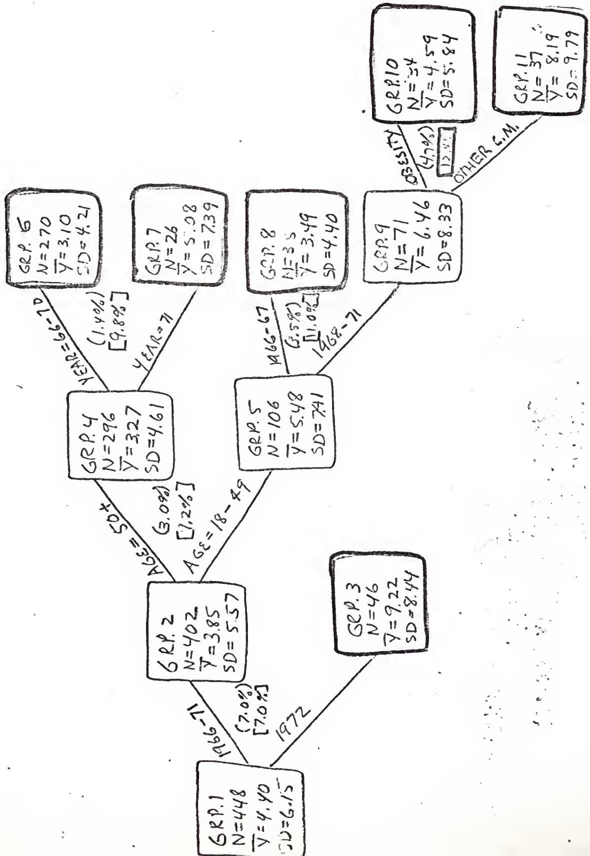
List of utilization variables that can be used as a step in AID analysis:

Drug classes that you specified as of interest- whether or not they were used at the index contact (U82,U85,U88), and/or no. of times they were used in the entire episode, and/or whether or nor they were used in a critical inital period appropriate to your diease.
Lab tests of interest (U57,61,63,67,65, if you need to examine index ct. separately.)
Radiology tests of interest
Specific office visit types (i.e., 9002, 9003, all mental health visits) of interest
Specific office procedures of interest (U26-31, if you need to examine index contact separatel
Specific types of phone calls (i.e., drug-realted) that are of interest
SCVAR1-7 (but excluding SCVAR 2 if you are using it as a dependent variable)- No. of hospital admissions, clinic contacts,house calls, provider visits to nursing home,ER contacts, phone/letter contacts, non-Kaiser MD contacts. Whether you use any of SCVARS1-7 as independent variables in an AID run will vary with your disease. U12 provides analagous information for the index contact.
SCVAR8-15-No. of contacts in ep. with service given by different types of provider- MD,RN, optometry, etc. U13 gives analogous information for the index contact. (Descrpitively, you may widh to ask the proportion of contacts in each episode which have service given by MDs, other types of providers.)
SMVAR25-40-No. of contacts in which the patient was ordered to return to MD, lab, etc. These are less likely to be useful to you than ohters in this list. Analogous information can be gotten for the index contact by using U32-U49.
Certain other varaibles may be interesting descriptively, but do not belonh in an AID run:% of total episode CRVS acounted for by phone/letter/ov/office proc./lab/rad. (PCTLETT-PCTXRAY), % of contacts with Y00.0 (physical exam) as a co-morbidity, % of contacts which occurred in hospital/clinic/ER/phone+letter, etc.

Another utilization variable which may be useful to create is whether or not the patient as asked to return at the last contact of the episode.

EXAMPLE AID RUN – STEP 1
PT/SYSTEM/MD VARS.

HTN AID RUN P-G   Dep. var: 1971 year total RVS – all eps. w/dur. ≥ 1 yr
LINPRO 31-03   Indep. vars: List I (see p. 4))

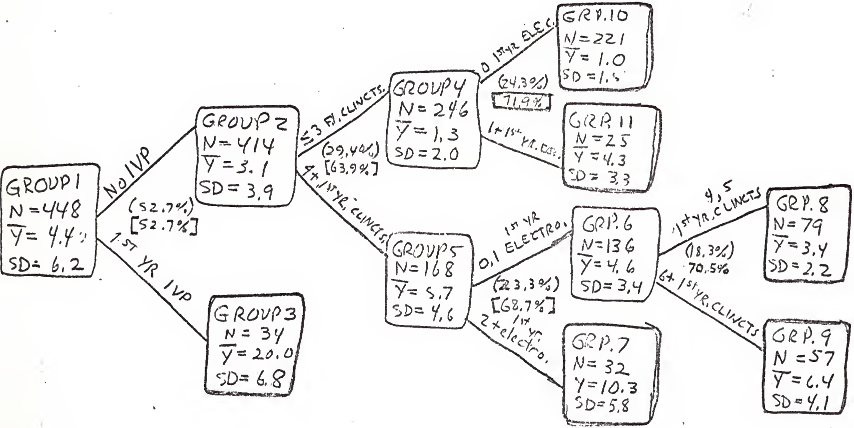


EXAMPLE AID RUN - STEP2
UTILIZATION VARS

AIN AID run of 6. Dep. var. 1 year total RVS. All eps. dur ≥ 1 yr.

LINPRO 35-03

Indep. vars: LI - III, except that no. of labs & xrays is counted over the first year only, and no. of clin. cts. is counted over the first year only.



INTER-OFFICE MEMORANDUM

TO Episode people
AT
COPIES TO

DATE 5/28/80
FROM Lee
AT

P.1, Memo 2

SUBJECT : SUMMARY OF INSTRUCTIONS ON HOW TO HANDLE YOUR PRINTOUT

Follow these steps:

I--Upon receiving the episode printout, examine it for errors, discrepancies, and missing information.

II--Decide which measures of resource use are appropriate for analysis of your condition.

1. Will you examine the behavior of a subclass of RVS, such as lab RVS, or will you examine only total RVS?
2. Will you examine the behavior of total clinic contacts, or other counts of the number of contacts (SCVAR1-7,37), in addition to examining RVS measures?
3. Will you use rates of resource use or total resource use as a dependent variable?
4. Within the episode, do you wish to examine an initial workup period in addition to examining the entire episode?
5. Do you need the calendar file?
6. Do you need to distinguish between new and continuing episodes?

~~7~~. Do you wish to examine adverse drug reactions as part of your episode?
~~8~~. Do you need to examine cases with special RVS codes (U106)?

III--Do a bivariate analysis of the data, with the critical resource use measure(s) as the dependent variable(s), and with each patient/physician/system variable taken separately as an independent variable. Use the BREAKDOWN program at this stage.

IV--Decide which set of episodes you wish to use in multivariate analysis and in examination of specific bundles of care.

V--Do multivariate analysis of sources of variation in resource use for episodes of your condition. Use AID and/or ANOVA and/or multiple regression.

VI--Having isolated key patient/system/MD factors which affect total resource use in handling episodes of your condition, examine how these factors affect the bundles of care (specific combinations of tests, OVs, drugs, hsopitalizations, procedures) for episodes of your disease.

INTER-OFFICE MEMORANDUM

To
At
Copies to

Date
From
At

p.2,memo 2

Subject : THE GORY DETAILS--HOW TO HANDLE YOUR PRINTOUT

I--UPON RECEIVING THE EPISODE PRINTOUT, EXAMINE IT FOR ERRORS, DISCREPANCIES, AND MISSING INFORMATION.

Look for these possible problems:
-Subtotals of RVS do not add up to total RVS .
-Subtotals of specific types of contacts do not add up to total contacts--if you specified such variables.
-Duration of episode, or mean number of comorbidities per contact in the episode, or other computed variables yield outlandish results, or results totally unexpected from inspection of the contact file.
-Error or confusion in labeling variables.
-Failure to create variables which you specified in your data request.

DO be sure to check the program at the front of your printout, to be sure that computed varaibles were created that have the meaning which you intended when you requested them.

Clear communication with Marilyn on what you want, when creating the episode file, or when asking for extra episode level variables, or when making an analysis request, will save you both much delay and toil.

II-DECIDE WHICH MEASURES OF RESOURCE USE ARE APPROPRIATE FOR ANALYSIS OF YOUR CONDITION.

1. Will you examine the behavior of a sub-class of RVS, such as lab RVS or office procedure RVS, or will you examine only total RVS?

   Examination of the share oftotal RVS which is accounted for by the subclasses of RVS, variables PCTLETT-PCTXRAY, will show which RVS classes contribute most to total RVS. This, with knowledge of medical decisions to be made in managing your condition, should help you decide whether to examine only total RVS as a measure of resource use, or to also examine lab, xray,etc. RVS subclasses.

2. Will you examine the behavior of total clinic contacts, or other counts of the number of contacts(SCVAR1-7,37), in addition to examining RVS measures?

   If a disease has many co-morbidities,the chances increase that services performed at that contact will have their RVS units coded to another condition. This may skew total RVS as a measure of resources used in managing your condition. If so, it is useful to examine SCVAR2, total clinic contacts, as a measure of total resource use to check and supplement SMVAR49,total RVS.Ask whether these two summary measures act similarly under the influence of age/sex/morbidity group/ other patient/MD/system variables of interest.

3. Will you use rates of resource use or total resource use as a dependent variable?

   If your disease is chronic, with episode lengths ranging from one contact to

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seven years,use rates of resource use per unit of time in the episode as your dependent variable. The characteristics of your disease dictate whether you examine RVS per week, month, 6 months, or per year;examine the DURATION variable in your file. An acute condition, for which all episodes are brief and of standard length, may be analyzed using either total RVS, etc., per episode, or by examining total RVS per week of the diease episode.

4. Within the episode, do you wish to examine an initial workup period as well as the entire episode?

Your disease may be one in which the first contact, or first week, or first month, or first year will call forth a different bundle of care and/or a different level of total resource use than the episode as a whole. If you have medical reason to think that this is the case, you should ask that measures of total resource use and/or measures of the bundle of care given be counted separately for the critical period as well as for the entire episode.

5. Do you need the calendar file? Applies only to chronic conditions.

First, do many of your episodes include contacts with care rendered while the patient was ineleigble for group coverage? Or, do you have medical reason to believe that people with your condition will repeatedly enter and leave the system over the period between their first and last contact? Would this repeated entry and departure substantially affect utilization? Is there good reason to think that repeated entry and departure is much more common for people with your condition than it was for hypertension? (Calendar file examination for that disease showed that such behavior was rare .)

If you answer yes to the above questions, you may need to use the calendar file to examine rates of resource use per episode year, etc. Without the calendar file, the rate of total RVS per episode year will be (total RVS/ months duration between first and last contact.) With the calendar file, the rate of total RVS per episode year will be (total RVS/ months between first and last contact that the patient was eligible.) This rate will adjust for patient dpeartures and reentries into the system.

If you want the calendar file, the first step is several days' delay while programmers extract the months eligible between first and last contact for each episode, and while they match the calendar file data to the Study 1 data. Then, you will get a printout with which you can confirm or deny your suspicion that the calendar file data is needed. The printout will list your episodes, with each chart no. accompanied by the episode duration, first to last contact, and by the months of patient eligibility, from the first to last contact. For all episodes, add up the total months eligible,

INTER-OFFICE MEMORANDUM

To

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From

At

Subject

and compare this sum to the sum of months duration between first and last contact.If you find a large discrepancy between these totals, you need to use the calendar file to get a proper rate of resource use for your disease.

Then, you either accept more delay as episodes which began in 1966 have correct calendar file information added to their records by hand, or you toss out episodes beginning in 1966. After more delay, you will get a rate of resource use for your disease based on months eligible, first-last contact.

A second reason you may want the calendar file is to explore whether the end of the episode of care was usually associated with the end of patient eligibility--as opposed to other reasons for patient or MD failure to follow through on care/monitoring of a chronic condition. What we have programmed now as a way to get at this issue is a count of the number of months that the patient was eligible for care between the first contact and the end of the study period. Comparison of this total with the months of patient eligibility for care between the first and last contact will give you a vague notion that the end of eligibility for group coverage might be associated with the end of chronic episodes. Or, you could ask for new programming: comparing the date of last contact for each episode with the last month of eligibility for that person. Either way, more delay.

6. Do you need to distinguish between new and continuing episodes?

Is there medical reason to think that a patient who appears at Kaiser with your disease as a pre-existing condition will get a different bundle of care or a different level of RVS use than somebody else with the same disease who has that illness diagnosed for the first time within the system? If so, you may want to get a list of cases from Marilyn, which will specify each case as new or continuing. You could then check this list against the morbidity record printout, to determine whether or not the computer was right in labeling a given episode as new or as continuing.(When I did this check for hypertension, I found numerous episodes in which the classification needed to be changed.)

7. Do you wish to examine adverse drug reactions as part of your episode?

If so, consider having Marilyn list out the chart numbers with drug reactions included in the episode, so that you can go to the morbidity record and decide whether a given drug reaction record is due to a drug given to treat the disease you are analyzing. (Tom did this for cystitis.)

8. Do you wish to examine cases with special RVS codes?

These codes are fpr procedures which are highly variable, and so could not be given a specific RVS value. In your Step 2 printout, the frequencies printout of the contacts of interest, you will find variable U106, which lists the number

INTER-OFFICE MEMORANDUM

To

At

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Date

From

At

Subject

of contacts withthese special codes. If there are a large number of these for your condition, you may want a listing of these cases, so that you can go to the morbidity file and examine which procedures these were.

III-DO A BIVARIATE ANALYSIS OF THE DATA, WITH THE CRITICAL RESOURCE USE MEASURE(S) AS THE DEPENDENT VARAIBLES(S), ANDWITH EACH PATIENT/SYSTEM/PHYSICIAN VARIABLE TAKEN SEPARATELY AS AN INDEPENDENT VARIABLE. USE THE BREAKDOWN PROGRAM AT THIS STAGE.

The objectives of this are:

1. To help you locate independent variables to put into multivariate equations. This is a fishing expedition. You will also be able to look at the BREAKDOWN results and decide what form the independent variables should take in a multiple regression equation. For example, should there be an age, age^2, or age+age^2 term in the equation?

2. To help you decide which set of episodes you wish to use in multivariate analysis and in examining specific bundles of care.

For example, you may find that there are a few episodes with contacts in which the patient was ineligible for group coverage. These episodes might be too few in number to analyze separately, but might have resource use patterns so different from episodes without any ineligible contacts that inclusion of episodes with ineligible contacts would diminish homogeneity. In this case, you might wish to throw these episodes out of all future analyses.

See Memo 3

You may also find, in examining your episode frequencies file and the BREAKDOWN results, that one set of episodes has characteristics indicating that your condition was an incidental discovery in a physical exam , and that these episodes were passed over by the system. So, you might decide that you should analyze only episodes with a certain minimum duration or a minimum number of contacts. (For example, I only analyzed hypertension episodes with duration greater than one year, for this reason.)

As you toss episodes out of the set which you wish to analyze, you gain homogeneity and lose sample size.

I DO MULTIVARIATE ANALYSIS OF SOURCES OF VARIATION IN RESOURCE USE FOR EPISODES OF YOUR CONDITION. USE AIDS AND/OR MULTPLE REGRESSION AND/OR ANOVA.

Your first step in multivariate analysis should be an AID run. You can use this

INTER-OFFICE MEMORANDUM

To

At

Copies to

Date

From

At

p.6 of memo 2

Subject

to isolate bundles of care, and to determine which paitent/system/physician variables have significant impact on resource use.

Depending on the characteristics of your disease, your earlier findingd, and the amount of time you have left to meet your deadline, you may also wish to do multiple regression and/or ANOVA.

V-HAVING ISOLATED KEY PATIENT/SYSTEM/MD FACTORS WHICH AFFECT TOTAL RESOURCE USE, EXAMINE HOW THESE FACTORS AFFECT THE BUNDLES OF CARE FOR YOUR DISEASE.

If, for example, you find that episodes beginning 1966-1969 have markedly different patterns of resource use than episodes beginning 1970-1973, you should examine how often early episodes got the specific lab tests, x-rays, office procedures, OVs, and drugs that you identified as being of interest and counted in the episode file. Compare the results for episodes beginning in the 1960s and those beginning in the 1970s by using CROSSTABS. This will tell you the proportion of cases which got a given test a given number of times.

An AID run can also be of use in defining bundles of care.

VI-The last step is to ask for any further tables that you may need to meet the objectives of the report, as outlines in memo #1.

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To
At Episode people

Date 5/30/80

From Lee

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MEMO 3 — AMENDED PROTOCOL

~~[illegible]~~ P. 1

Subject : STEPS TO FOLLOW IN ANALYSIS-AN AMENDMENT OF MEMO 2 BASED ON DISCUSSION WITH JANE AND JOHN ON THE POTENTIAL FOR AID.

1. As specified in memo 2, examine your episode printout for errors, discrepancies, and massing information.

2. As specified in memo 2, decide which measures of resource use are appropriate for your disease.

3. Do bivariate analysis of resource use. This is an initial fishing expedition, so examine either total RVS or rates of total RVS per episode year,etc. If you have identified one or two other critical resource use measures, use them too at this stage as dependent variables.

(This is a comprehensive list of episode-level independent variables you can use for this step. Choose those appropriate to your disease & population.

For each dependent variable that you choose, ask for a BREAKDOWN run of that variable as a function of these patient/provider/system variables:

---Agegroup at index contact.

Suppose you have 3 age groups: 18-34, 35-49, and 50+. With BREAKDOWN, you will get the mean resource use for people in each age group, and a standard deviation, and the number of people in each age group. Use of the standard deviation, or the calculation of the standard error of the mean for each age group, will enable you to tell whether, taken alone, the age groups you chose ~~are predictive~~ signif. differ of resource use.

POINTER: You may be undecided whether to use a 3, 4, or N-class age group. If you do a BREAKDOWN on the two or three age groupings that you have in mind, you will be able to tell whether the two or three ways of grouping by age tell the same story in resource use patterns.If a 3-class age grouping and a 4,5,or 10-class age grouping reveal similar patterns of resource use with age, use the age grouping with the smallest number of subclasses for the remainder of your analysis.Likewise, if you initially created only 1 agegroup varaible, with three classes, and this BREAKDOWN reveals that two adjacent ~~two~~ classes have similar resource use, and one is significantly higher than the other two, then create a new agegroup variable with only 2 classes. One class would be a combination of the two similar age classes in your first agegroup variable, and the other would be the standout age class. The rationale is that the analysis becomes more tedious and cumbersome with each extra cell you create.Creating unneeded cells will add markedly to your workload in preparing the report.Use this BREAKDOWN step as, among other things, a way to cut the number of cells in key variables.

----Co-morbidity group.

Be sure to create morbidity groups that are mutually exclusive and which , taken together, include all the episodes in the population you wish to analyze.Create as few morbidity groups as is reasonable for your set of episodes. Again, the aim is to cut the number of cells you must analyze.

---Sex, if relevant to your population/disease.

NOTE: Each subclass of your independent variables should have a population of ≥ 25, and preferably ≥ 50, for this part of the analysis.

INTER-OFFICE MEMORANDUM

To

At

Copies to

Date

From

At

Memo 3, p. 2

Subject

---PCTPRES, the % of contacts in your episode in which your disease is the presenting morbidity for the contact. This is a continuous varaible which should have its values grouped into classes to be used with BREAKDOWN. This same advice holds for other continuous varaibles, including others such as PCTLETT-PCTXRAY.

---Presence or absence of symptoms of interest, if you created such a variable

---Presence or absence of adverse drug reaction in the episode, if you created such a variable.

---New versus continuing episodes

---Either MNCOMORB', the mean number of comorbidities per contact, (if your disease is chronic) or U50, no. of comorbidities in the index contact, if your episode is acute.

---Year of index xontact

---Episode duration, expressed in appropriate time units and divided into subclasses.

---MD specialty at index contact, if your disease is acute

---MD number at index contact .
The intent here is to capture interphysician variance. This variable will serve that purpose best if we create a variable for each episode which indicates whether, for all the other contacts in the episode, the patient continued to see the provider who s/he saw at the index contact. We can then get a count of the number of episodes which were attended by only one doctor, broken down by the provider number at the index contact. Then, to examine interphysician variance, choose the doctors who saw over 20 single doctor episodes. Use the one-doctor episodes as the population for the BREAKDOWN, with the resource measure(s) as the dependent variable and the doctors* who see at least 20 such episodes as the independent variable. This method will likely work only for acute diseases; it seems very unlikely that many people with a chronic episode lasting many years will see only one provider for that disease. How can we test inter-MD variance for chronic eps?

---MD status at index contact

---Specialty over the episode.(derive from SCVAR19-SCVAR31)
You may find, that in SCVAR19-31, most MD contacts for your disease are with internists, and that 20% of contacts over the whole episode are with other specialties. You may wish to ask whether the mean total RVS use for patients with disease X is different for those who saw only internists in their episode than it is for those whose episodes included at least one visit to an MD of another specialty.(Is res. use different for diabetics who saw a urologist or opthamol. than for others?

---MD status over the episode (derive from SCVAR 32-34)
Here, you may wish to ask whether mean RVS use is significantly different for those whose episodes included a visit to a consultant than for those who did not see a consultant.

---Diagnosis status at index contact

---Presence or absence of contacts in the episode for which the patient is ineligible for plan coverage.

K-6 9-70

* For runs with U16-MD# - as indep.var., if you find that MD specialty affects rt. of res. use, choose only MDs. with a common specialty to put into each

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From

At

Subject

---Percent of contacts which are in clinic hours
Here, your intent would be to ask whether resource use is more intense for episodes with all contact falling in clinic hours, versus those which had some night or holiday visits.Divide this var. into classes to use it as indep. var.
---Percent of contacts which are regularly scheduled.
Does it make a difference in resource use whether the episode include some vs. no walkin visits?
---Presence or absence of hospital admissions
---Presence or absence of emergency room contacts
---Presence or absence of other types of contacts enumerated in SCVAR 1-7 that are of ibterest for your dieease.
---Percent of episodes with Y00.0, physical exam, as comorbidity.
---Presence or absence of special types of provider in episode, as enumerated in SCVAR8-15.
---Presence or absence of different types of orders to return for care, as enumerated in SMVAR25-40.

This is a list of suggestions of variables you may wish to examine using BREAKDOWN. This analysis should be rapid and easy; using these results in conjunction with the printout of episode frequencies,you will have:
--a means of deciding whether certain episodes should be discarded from all future analysis.
--guidance on the form each independent variable should take in a multiple regression equation.
--basic information on which independent variables do, and which do not, affect episode resource use.

At a later stage in the analysis, depending on time pressures and the results you got from the AID runs,you may find it useful to use breakdowns for more descriptive data. Suppose that, in this first use of BREAKDOWN, as stated above, you used total clinic contacts and total RVS as dependent variables, and that you found 12 of the 25 variables listed above to have statistically significant influence on resource use. You could take more detailed measures of resource use, such as no. of drugs ordered, or RVS subclasses, as new dependent variables, and run breakdowns on them using the 12 independent variables that you earlier found to be significant.

WHEN YOU DO BREAKDOWNS, USE ONLY ONE DEPENDENT AND ONE INDEPENDENT VARAIBLE. THE BREAKDOWN PROGRAM CAN GIVE RESULTS IF YOU USE MULTIPLE DEPENDENT VARIABLES, BUT THESE RESULTS ARE A TANGLED MESS. NOW THAT WE HAVE AID , WE CAN AVOID THAT TANGLED MESS ENTIRELY.

INTER-OFFICE MEMORANDUM

To

At

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Date

From

At

MEMO 3,p. 4

Subject

4.DO MULTIVARIATE ANALYSIS.

A. Begin with AID.

The first step is to use AID to show interacting effects of non-utilization patient/MD/system variables, as named in Memo 3 and in the above section in this memo, on resource use. For each run:

--choose one dependent variable, a measure of resource use
--choose up to 36 independent variables. Be sure that all independent variables are independent of each other.
--do NOT include 'percent' independent variables, such as percent of contacts which are phone/letter, or percent of RVS which is lab, etc.
--consider whether you should eliminate continuing episodes from AID analysis.
--decide how to handle episodes which may be truncated at the end by the end of the study period. If you decide that an episode of disease X does not meet medical criteria for an episode unless it lasts over 3 months, eliminate episodes from your analysis that begin after September 30, 1973.
--As a group,we need to decide whether to change the stop rules that John used for hypertension and cycstitis.
--be sure the independent variables are in fact independent of the dependent variable.
--state continuous independent variables as categories. Each indep.var. category should have at least 25, and preferably 50, episodes.

The result of this first run should be to isolate which patient/system/MD variables affect resource use, and to show the interaction between them.For step one, each terminal box should include a popualtion which is relatively homogenous with respect to nonutilization characteristics, and with respect to RVS.

For step one, we should decide whether to put the patient and system and MD variables together in one run, or whether to do one run with patient variables, one with system variables, and another with MD variables.

The second step in the AID process is to use it to define bundles of care. For each run:

--choose one dependent variable, a measure of resource use.
--choose a set of independent variables. All these would be utilization measures,as defined in memc 4.These would include drug classes of interest, lab and xray tests of interest, specific office visits of interest,office procedures of interest,presence or absence of specific types of phone calls of interest (i.e.,drug-realted), presence or absence of specific types of contacts of interest (i.e.,hospitalization, ERvisit, house call),etc.
--Do not use 'percent' variables. Each independent variable should be specific and medically meaningful.

INTER-OFFICE MEMORANDUM

To

At

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Date

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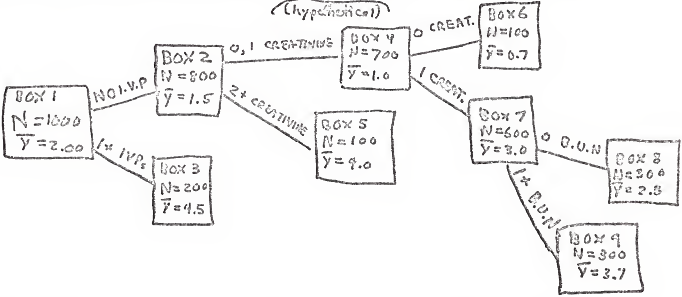
At

Memo 3, p.5

Subject

The result of step two in AID should be delineation of several pathways of specific types of utilization, as in the example below:
(hypothetical)



In this example, we have 5 sets of people, each with a distinctive bundle of lab and x-ray tests. Each box of people is relatively homogenous with respect to RVS--more so, at least, than the entire population. This is the first stab at defining bundles of care.

The third step in AID is to determine how people end up in the five distinctive bundles of care, as shown in the example. Several options are open to us:
--John says that he can, within a short period of time, give us a probability/ multiple discriminant program. It would take the patient/system/MD characteristics of the people in each of the boxes, and assess how the presence of absence of a given mix of characteristics influences the odds that a given person will fall into box 4, as opposed to box 3, or 2, or 1, or 5.
--If this is unsuccessful, we could take a more laborious path to find the different characteristics of the populations in the 5 different boxes. For the people in each subset, we could get mean age, proportion of episodes which are in the different comorbidity groups, proportion that are male or female, proportion that are new vs. continuing episodes, and other relevant patient/ system/MD characteristics. Generally, this would be available from a FREQUENCIES run, taken for each of the 5 boxes separately. Unlike John's program, this would be a descriptive, not analytical, way of showing the differences among the five populations.

INTER-OFFICE MEMORANDUM

TO

AT

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FROM

AT

[redacted] Memo 3, p.6

SUBJECT

--Or, we could take the population in each of the five boxes sepraratelv, and run another AID program against each of them. This would use patient/system/MD varaibles as the independent varaibles. Or, we could run a multiple regression against each of the 5 subpopulations, using the patient/system/provider variables as independent variables.

--Or, we could take a reverse approach to defining bundles. The step one AID program will define subpopulations which are relatively homogenous with respect to non-utilization characteristics. We could take each of these subpopualtions, and run the utilization AID program against it.

John's program, if we can get it , seems to offer the most elegant way to define how nonutilization characteristics of a population affect the likelihood that a person will get a given bundle of care.

If the AID program and John's discriminant program work as well as they promise to, we are likely to need to do few or no multiple linear regressions in our analyses. Nor are we likely to need ANOVA programs, much less BREAKDOWN programs with 2 to 5 independent variables. Tom and I had used tons of CROSSTABS programs in analyzing our diseases; use of AID to define bundles of care and the populations receiving them should make these unnecessary, except in special cases.Nor should we need Pearson product-moment correlation. The AID, BREAKDOWN, and probability/discriminant runs I have discussed here should allow us to meet the objectives of the Phase I rpeort.

We may wish to include additional descriptive data from FREQUENCIES runs on the entire set of episodes that we choose for analysis, on special subpopulations, or to show why we discard a certain set of episodes from analysis. This descriptive data may include mean age, the proportion of people in the population who fall into different comorbidity groups,mean episode duration,sex distribution.proportion with symptoms of interest in the episode,proportion of new vs. comtiniung episodes,year of index xontact, diagnosis status at index contact, and other patient/system/MD variables as listed in Memo [illegible]. Choose descriptive data which is of interest for your disease, but avoid burdening the reader with extraneous numbers and tables.

One large unsolved problem remains: for chronic diseases, how are we going to measure the effect of interphysician varaition on resource use?THIS NEEDS DISCUSSION AT THE EPISODE MEETING.

INTER-OFFICE MEMORANDUM

TO Episode people
AT
COPIES TO Variable classif.

DATE 5/30/80
FROM Lee
AT

Memo 34— P. 1, ~~[illegible]~~. Var. list

SUBJECT : List of variables that are measures of resource use. These are summary measures, not tied to a specific procedure. Which you use varies by disease.

CONTACT LEVEL--- refers to the contact frequencies file and to the index contact file that is on your episode printout.

U101-total CRVS of lab procedures
U102-total CRVS of xray procedures
U103-total CRVS of surgical office procedures
U104-total CRVS of adult office procedures
U105-total CRVS of pediatric office procedures
U106-No. of special CRVS code(s) in the contact(s)

EPISODE LEVEL
SMVAR 41-No. of lab tests in episode
SMVAR 42-No. of radiology tests this episode
SMVAR 43-No. of drugs ordered this episode
SMVAR 44-Total lab CRVS
SMVAR 45-Total radiology CRVS
SMVAR 46-Total office surgery CRVS
SMVAR 47-Total office adult CRVS
SMVAR 48-Total office peds CRVS
SMVAR 49-Total CRVS this episode
OFFICRVS- office CRVS
LETTCRVS- letter CRVS
PHONCRVS- phone call RVS
OVCRVS- office visit CRVS
OPROCRVS- office procedure RVS
NO. OF DRUG CALLS - May be a proxy for drug use that would cover the whole study period, not just the '72/'73 period for which drug data are available.

For most diseases, the best measures will be:

SMVAR 49	OPROCRVS
SMVAR 44	SMVAR 43
SMVAR 45	NO. OF DRUG CALLS
OVCRVS	

Note: For each episode, SMVAR44+45+46+47+48=49
OFFICRVS=LETTCRVS+PHONCRVS+OVCRVS+PHONCRVS=SMVAR46+47+48
SMVAR49=OFFICRVS+SMVAR44+SMVAR45

Other measures of resource use include rates of RVS use per episode year or per episode month, and total RVS use during a critical initial period in your episodes.

Summary counts of contacts which can be used to check results gotten by analysis of RVS use are:

SCVAR 1---No. of hospital admissions
SCVAR 2---No. of clinic contacts
SCVAR 3---No. of visits to patient house
SCVAR 4---No. of visits to nursing home
SCVAR 5---No. of emergency room contacts
SCVAR 6---No. of phone+letter contacts
SCVAR 7---No. of contacts with non-Kaiser MD
SCVAR 37--Total no. of contacts in episode

THESE CONTACT MEASURES, ESPECIALL THOSE OTHER THAN SCVAR2 (OR PERHAPS SCVAR 37), CAN ALSO BE USE AS MEASURES OF THE BUNDLE OF CARE GIVEN IN AN EPISODE.

Of these variables, SCVAR2 is likely to be the best check on RVS-based measures of resource use; SCVAR37 may also be useful, depending on the nature of your disease (i.e., if management of your episodes involves a high proportion of non-clinic contacts.)

K-6 9-70

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memo 4 – p. 2 Var. List

Subject : LIST OF PATIENT-RELATED VARIABLES,FOR USE AS INDEPENDENT VARAIBLES

U04-Sex
U05-Age at index contact. Or, use AGEGRP.
*U10-At the index contact, is the given morbidity record the presenting morbidity or the 1st through 8th associated morbidity? At the episode level, get at this issue by using PCTPRES, the percent of contacts within the episode in which the disease you are analyzing is the presenting morbidity.
Comorbidity group membership. (I.e., for hypertension, was the episode of htn. accompanied byheart disease, or by obesity, or by diabetes, or by a combination of these, or by none of these?)
Presence or absence of symptoms of interest for your disease--if you created such a variable
New or continuing episode
*U50-No. of comorbisities at the index contact. Or, at the episode level, use the mean number of comorbidities per contact in the entire episode,MNCOMORB.
Depending on your disease, you may use these:
- No. of morbidities in which your disease was the presenting morbidity for the contact, and was updated to something else.
- No. of times in the episode that the presenting morbidity was not your disease, and the updated presenting morbidity was your disease.
- Presence of adverse drug reaction as comorbidity or as updated presenting morbidity within the episode.

Year of first contact , OR episode duration, expressed in days, months, or years

* These may also be treated as system-related variables. If you are doing a run with comorbidity group as an independent variable, it may be necessary to use PCTPRES/U10 and U50/MNCOMORB in a separate run — otherwise, as occurred in hypertension, PCTPRES and MNCOMORB might swamp comorbidity group.

K-6 9-70

INTER-OFFICE MEMORANDUM

To

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Memo 4 P.3 Var. list.

Subject

: LIST OF MD-RELATED VARIABLES

U16-MD number at index contact
U17-MD status at index contact (regular, temporary, or consulting)
MDSERV1- Specialty of attending MD at index contact, or if there are a smaller number of specialty groups which you wish to analyze, lump some of the specialties together and use RMDSERV1.
MDSERV2- Specialty of referring physician at index contact. (May not be needed for most diseases.)
* SCVAR 19-31--No. of times in episode that a patient is seen by an MD of a given specialty.
* SCVAR 32-34--No. of times a patient is seen by regulat attending/temporary attending/ consulting MD in the episode.
Proposed varaible :
--Number of different MDs that the patient sees over the episode. If the patient sees only one MD over the entire episode, we can get at interphysician variance by using MD no. at the index contact as independent varaible.

* This may be used descriptively: If there are 3 MD groupings of interest for your disease – internist, ob-gyn, and all other MDs, you can ask the % of cts. in each ep. seen by internists, % seen by obgyns, % seen by all other providers. Likewise for SCVARS 32-34: if you need it, you can get descriptions: % of cts. where the provider was a consultant, etc.

K-6 9-70

INTER-OFFICE MEMORANDUM

To

At

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Memo 4

Date

From

At

P. 4 - Var. list

Subject

: List of system-ralated variables

SCVAR 32-34-No. of contacts in episode that have a diagnosis of tent./unk/estab. status.
U19-Diagnosis status at index contact
U70-Health plan eligibility status at index contact
SCVAR36-no. of contacts in episode at which patient is ineligible for health plan cov.
SCVAR 16- No. of contacts in ep. that were during clinic hours (U14, index ct.)
SCVAR 17- No. of contacts in ep. that were reg. sched. appts.(U15, index ct.)
SCVAR 18- No. of contacts in ep. that were walkin
For descriptive purposes, you may also use the % of contacts that were walkin/reg. sched./ineligible/in clinic hours/ dx. unknown/dx.estab./dx.tentative.

List of utilization variables that can be used as a step in AID analysis:
Drug classes that you specified as of interest- whether or not they were used at the index contact (U82,U85,U88), and/or no. of times they were used in the entire episode, and/or whether or nor they were used in a critical inital period appropriate to your disease.
Lab tests of interest (U57,61,63,67,65, if you need to examine index ct. separately.)
Radiology tests of interest
Specific office visit types (i.e., 9002, 9003, all mental health visits) of interest
Specific office procedures of interest (U26-31, if you need to examine index contact separatel
Specific types of phone calls (i.e., drug-realted) that are of interest
SCVAR1-7 (but excluding SCVAR 2 if you are using it as a dependent variable)- No. of hospital admissions, clinic contacts,house calls, provider visits to nursing home,ER contacts, phone/letter contacts, non-Kaiser MD contacts. Whether you use any of SCVARS1-7 as independent variables in an AID run will vary with your disease. U12 provides analagous information for the index contact.
SCVAR8-15-No. of contacts in ep. with service given by different types of provider- MD,RN, optometry, etc. U13 gives analogous information for the index contact. (Descrpitively, you may widh to ask the proportion of contacts in each episode which have service given by MDs, other types of providers.)
SMVAR25-40-No. of contacts in which the patient was ordered to return to MD, lab, etc. These are less likely to be useful to you than ohters in this list. Analogous information can be gotten for the index contact by using U32-U49.
Certain other varaibles may be interesting descriptively, but do not belonh in an AID run:% of total episode CRVS acounted for by phone/letter/ov/office proc./lab/rad. (PCTLETT-PCTXRAY), % of contacts with Y00.0 (physical exam) as a co-morbidity, % of contacts which occurred in hospital/clinic/ER/phone+letter, etc.

nother utilization variable which may be useful to create is whether or not the patient asked to return at the last contact of the episode.

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